Support the XL/XE? Not me ...



but you can

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Page 6 Publishing's NEW

ATARI USER

The Resource for the ATARI CLASSIC and the ATARI ST

Issue 72 - June/July 1995 £2.50

FOR THE ATARI CLASSIC



✪ *DISKS AND DOS*

Find out what actually gets written onto your disks

✪ *BIG SCREEN*

Use the screen margins for your own displays

✪ *MULTI FORMAT*

Format and write DOS how you want it

FOR THE ATARI ST

ATARI WORLD

A review of the new ST mag

PUBLIC DOMAIN

a continuing look at the Budgie range

PLUS ... THE TIPSTER ... COUNTING SYSTEMS ... RANDOM NUMBERS ... NEW SOFTWARE! ... AND MORE

This issue's ....

Thanks

Les Ellingham puts it all together and fills up the gaps but the real thanks goes to the following who made this issue possible

Sandy Ellingham who takes care of all the office work, advertising and mail order

For their regular contributions

John S Davison **Allan J. Palmer**
Paul Rixon **Stuart Murray**
Ian Finlayson **Mark Stinson**

For their contributions this issue

Daniel Baverstock **Johnny Chan**
Ann O'Driscoll **John Foskett**
David Sargeant **Paul Hollins**
Leslie Benson **M. Tomlin**

Thanks to all who continue to support the magazine and the PD library. Your last chance now to support the Accessory Shop. Go to it!

Some of these folk have supported us from almost the beginning and without them we would not be here. Some are having articles published for the first time. All are to be thanked for sharing their enthusiasm with all who read New Atari User

HOW IT'S DONE

PAGE 6 shows just what you can do with your Atari. NEW ATARI USER has always been created entirely with Atari equipment, initially on the XL but more lately with a Mega ST and other stuff, who needs PC's or Macs! Hardware includes a Mega ST2 (upgraded to 4Mb), SM125 Monitor, Supra 30Mb Hard Disk, a HP Laserjet III, Citizen 124D printer, Philips CM8833 monitor, 130XE, a couple of 1050 disk drives, 850 interface, NEC 8023 printer. Principal software used is Protext and Fleet Street Publisher 3.0. Other software includes Kermit, TariTalk, Turbo Basic and various custom written programs on the XL/XE. Articles submitted on XL/XE disks are transferred across to the ST via TARITALK. Programs are coded on the XE and printed out directly for pasting in after the typesetting is completed. All major editing is done with Protext and pages are laid out with Fleet Street Publisher. Each page is output directly from Fleet Street to a HP Laserjet III which produces finished pages exactly as you see them. All that is left is to drop in the listings and photos.

Well, it's not quite as easy as that but you get the idea!

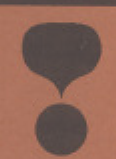
Inspiration

New sounds this issue! The opportunity recently came up to get a couple of new CD's but what to get from a list that has now grown so long I'll have to set up a database! Then the South Bank Show did a feature on female country singers which included Mary Chapin-Carpenter (who is definitely not a country singer) so it seemed worth a watch. Sure there were country singers, like Pam Tillis, but there was also Kathy Mattea who, like Mary Chapin-Carpenter, I had considered many years ago and I was also struck by Martina McBride. Our local Our Price had Ready For The Storm, a compilation by Kathy Mattea and The Way That I Am by Martina McBride. The former is excellent with some well known songs I have by Irish artists but also some superb new songs. Well worth the investment and the dozens of plays while I work. The Martina McBride is much more country and after the first two tracks I though that I had made a mistake but then it all changes and becomes an good album with shades of Janis Ian, Michael Johnson and others and a couple of outstanding tracks. Press the forward skip button twice at the beginning and it's had many plays. Nice to have something new to report, even if it is drifting dangerously close to Dolly Parton country!

CONTRIBUTIONS

Without contributions from its readers, NEW ATARI USER would not be possible. PAGE 6 welcomes and encourages its readers to submit, articles, programs and reviews for publication. Programs must be submitted on disk or cassette, articles should wherever possible be submitted as text files on disk. We seek to encourage your participation and do not have strict rules for submissions. If something interests you, write a program or article and submit it!

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'The Magazine for the Dedicated Atari User'

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REVIEWS

The next issue of NEW ATARI USER is due to be published on 31st July
Editorial copy date is 30th June

SUBSCRIPTIONS

MAGAZINE ONLY

Annual subscription rates (6 issues)

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Overseas rates reflect only the difference in postal costs

DISK SUBSCRIPTION

A disk containing all of the 8-bit programs from each issue of NEW ATARI USER is available either separately or on subscription. Single price £2.95 per disk, a disk subscription saves you almost £8 a year. Subscription rates (6 issues)

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Europe	£32.00
Elsewhere (sea)	£32.00
Elsewhere (Air)	£42.00

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Editorial

ACCESSORY SHOP CLOSEOUT

The time has come for a reorganisation of our Accessory Shop. It seems unlikely now that we will find any more software for the Atari so I have decided to have what the Americans call a closeout sale on the remaining items of software. We will in future concentrate our 'extra' sales on the Public Domain library and the items of software that we have developed ourselves and I am sure that you will continue to support us in this.

Right now there are some super bargains to be had on a variety of software. This is the time to buy everything that is not already in your collection, you may never get the chance again. You will find top quality ROM cartridges at just £2 each, disks from 50p each and cassettes from an amazing 20p each! Maybe this is the time to give Transdisk a go. Grab yourself 10 cassettes for a couple of quid and transfer them to disk to give your system a new lease of life. You have always supported us magnificently with various sales, so I ask you to give us that support once more. Let's see if we can clear all this software in one go and not leave it hanging around.

One extra advantage of closing down the software sales is that we will no longer have to advertise the software in the magazine and so can free up several pages of the magazine giving us additional options for future issues.

A GOODBYE

For almost as long as I have been producing Page 6 I have been reading the American magazine Current Notes which I have always considered to be excellent. It's editor, Joe Waters, seems to have trod the same path as myself over the last 11 years and I know how much goes into producing each issue. Sadly, Joe has now decided to call it a day following a recent illness which he seems to feel might have been exacerbated by the pressures of producing a magazine for so long (believe me, Joe, it takes its toll!). Current Notes will continue but from the way many columnists say goodbye in the current issue it looks like it may spread its wings and move away from Atari.

In his last editorial Joe makes the comment *'The columnists have been a significant contribution to the ongoing success of the magazine. For the past 11 years, articles have just shown up when it was time to put an issue together. With a solid group of strong, regular contributors. I could always count on an interesting and exciting magazine even though I never knew from month to month what would appear.'*

I could have written those words myself about Page 6. Take a bow everyone who is reading this who has made a contribution to the magazine over the years. Those who support us by subscribing and ordering software now know just who are the most important elements of this wonderful enterprise.

One thing gleaned from Current Notes is that a correspondent recently called Atari to enquire about technical support for the ST to be told that 'Atari are no longer a computer company'. Now haven't we really suspected that for some time?

Les Ellingham



GET PLUGGED IN

The Atari Classic Programmer's Club are to shortly introduce a new item of hardware for the Atari. Scheduled to be available in June or July is the **ROM BANK**, a hardware device that allows several ROM cartridges to be connected to your Atari at one time.

The ROM BANK is modelled on the ROM scanners that were once available for the Atari 2600 games console. Several cartridges can be connected, semi-permanently to your Atari and the desired cartridge selected at the push of a button. A single ROM BANK houses up to 8 cartridges but units can be daisy-chained together to enable more cartridges to be connected up. The ROM BANK fits into your cartridge slot and requires just a small hardware modification to be performed in order to fit a single wire inside the computer.

Two versions of the ROM BANK will be available. The Master unit contains the hardware modification and an on/off switch that allows you to use disk and cassette software with the unit still attached to the cartridge slot. The Slave unit is an extra 8 slot unit that can be connected to the master unit and set up in a tree-like structure to accommodate additional cartridges.

The ROM BANK Master unit will retail at £60 ($95) and the Slave unit will be £55 ($90). A discount is available for members of ACPC. Prices include postage and packing. If you want to place an advance order a substantial discount is being offered for orders received before 30th June 1995. The Master unit will be available at £45 ($75) and the Slave unit is £40 ($65). ACPC promise that cheques will not be cashed until the units are ready for despatch.

Orders, or further details, should be addressed to David Wyn Davies at The Atari Classic Programmer's Club, Pen-Tyddyn, Capel Coch, Llangefni, Anglesey, Gwynedd LL77 7UR.

SOFTWARE COPYING

A few years ago we would have frowned upon any disk drive enhancer that made it possible to copy protected software but times have changed and nowadays it is important to be able to back up all of your software. In many cases there is now no possible way of obtaining replacements for the majority of software.

Chaos Computers, run by a long time supporter of Page 6 magazine, has recently announced the **HYPER DRIVE** enhancement which can be added to your disk drive to allow you to copy most protected software. The package comes with its own software and a 28 page manual and will work with most drives, including those with US Doubler fitments. Retail price is £30. We have not yet had the chance to test the device out but similar devices have appeared over the years and we have no reason to doubt its efficiency.

For more information contact contact Chaos Computers at P.O. Box 30, Manchester M19 2DX. Telephone 0161 737 1946.

PLEASE NOTE THE NEW TELEPHONE NUMBER FOR PAGE 6

01785 41153

effective now!



Mailbag



Looks like that postman is carrying a full sack of mail!

Quite a few letters this time, so without further ado and before the Dreaded Deadline Doom catches up with me, on with this month's Mailbag ...

Allan J. Palmer

SOME THANKS

F W Jones from Plymouth in Devon writes to say he "...appreciates and likes the new format of the magazine." *He is* "...now 70 years old and can remember when Page 6 was sold on a tape cassette mounted on a card" - *this surprises me, Mr Jones, as I don't believe PAGE 6 (NAU) was ever sold on cassette due to the costs/problems in tape duplication and posting; perhaps Les can confirm or deny this? F W concludes with* "...keep up the good work Les as long as you can because to me your magazine is an old friend".

❢ *[You seem to be getting confused Mr Jones, understandably so, with a tape based magazine put out many years ago by another publisher. The 'magazine' consisted of a tape with articles and programs mounted on an A4 sheet of card. We had a full colour advertisement on the back of the card, which cost us £250, and which was a disaster as we did not have one single response! Apparently, because it was not clear that ours was an advertisement most people thought that we were the publishers and as they had already bought the product there was no need to do any more! The tape was supposed to have had about 15,000 distribution and we had not one enquiry so that was £250 wasted. It turned out not to be quite so bad in the end as the company returned our cheque but it still cost us around £100 or so for the film for the advert. Incidentally, a few issues later the 'tape mag' disappeared. Ed.]*

➾ *From Harlow in Essex, Tom Allen drops a short note mentioning that his* "...first awareness of the computer world was a 4K Tandy with Mini-BASIC..." *before he acquired an Atari 800 and later an 800XL. He has had* "...much fun with Music Composer (ROM) all the way from Haydn's Emperor Quartet to Elvis Presley songs ..." and *"...has more time for this kind of intellectual fun now I am retired".*

PRINT SHOP

Jack Vincent is another Devonian - from Beaworthy - he enquires about Broderbund's "Print Shop": "I have designed several posters lately, and then been asked to repeat them. It's not too hard to do provided one has kept a copy, but it would be easier to do if it was on a file. Is there any way (in Print Shop) to save to disk a layout once one has designed a card or poster? Also, how can one unlock the main disk to add items to it?"

❢ *Unfortunately Jack, the original version of Print Shop for the Atari, Apple, Commodore (and even IBM?) didn't include this facility - presumably because they couldn't work out a file format to cater for all the possible designs and then additional functionality to re-load previously saved designs ... who knows? I am unsure what you mean about unlocking the main disk to add items to it. It's not advisable to add other programs to the master disk in case you corrupt the original files - the only recommended additions are to use the Print Shop Companion disk to upgrade the original with the additional Companion features. Perhaps you could write again to explain what you mean.*

DISKS

Dave Bennett from Coventry sent a letter with a number of observations. He was lucky at a recent car boot sale, "...a stall had some old, used IBM disks so I now have plenty of 5¼" disks that I can reformat for my needs. Some of the disks were High Density (Goldstar M-HD) and even Quad Density (M-2HD), both originally soft sectored to 96tpi according to the labels. I also have a box of HD 3½" disks that I got in error for my STE some time ago. I have used the 3½" disks as backup disks with no problems for some time, but seem to remember being told that HD disks could cause problems, even when formatted as normal Double Density disks. Do you have any advice or comments please?"

❢ *As regards, 5¼" disks for your Classic Atari, you shouldn't have any problems. As I've never used an ST(E), I can't comment on the 3½" disks - am I correct in understanding that the STE drive only supports DD format? I'm sure one of our more knowledgeable ST users will be able to comment.*

➾ *Dave also reports that at another car boot sale he found incomplete sets of Atari disks for 'Indy' and 'Strider' - he's curious to know if these games are still available and what they are about - can anyone supply information? Following the questions in earlier columns about the availability of disk storage boxes, Dave says he went looking for storage boxes for 5¼" disks and got mixed response - boxes no longer stocked, boxes for 100 disks sold recently for 2-3 pounds as CD holders(!) and now out of stock, but finally found a shop glad to get rid of them at half price for 2. Dave advises be persistent and check your local computer and office equipment shops.*

OLD PROGRAMS

Dave Bennett also comments that he collected the 'original' Atari User magazine from issue 1, but only started getting the issue disks when AU and PAGE 6 merged. Dave continues "...there were many good program listings that I never used in the original Atari User, and it seems likely that others may not have seen them, or not bothered to type them in. Does Page 6 now hold the copyright to these programs, and if so could some of the programs be put on future disks, possibly with a short update text in the magazine?"

❢ *This is a question for our esteemed publisher to answer, so I'll have to hand this over to him. In the meantime, I trust you've noticed that Page 6 has extended it's line of back issue disks - with the current issue, disks back to issue 6 are now available with, hopefully, the others to follow next time.*

[The question of copyright on programs published before we bought Atari User was never really established but I cannot foresee any problems in our reprinting any of these listings. The problem is that we do not hold any back issues of the old Atari User and therefore have no access to either the programs or the articles. If any of the authors of those programs would like to see them published again, and they still have copies of their original submissions, then we would be delighted to consider them. Ed.]

MONITORS

Responding to an enquiry in a previous issue, B Wright from Hull, North Humberside writes to advise that with his 130XE and STE, "...I have a Philips CM 8833 monitor with the 130XE connected into the composite video input. This comes from the monitor output on the XE to the video in and audio in phono sockets. The STE monitor output connects into the SCART socket on the monitor. Both computers can be on at the same time and the picture switched from one to the other with the input switch on the front of the monitor."

From Brighton, regular correspondent Daniel Baverstock has this to add on the subject: 'The most common monitor



in my experience is the Philips CM8833-II colour monitor. They are sold regularly secondhand in Micro Mart for £100 - £140 and can be connected by a 5-pin din splitting to two phono sockets (one audio, one composite video). This monitor gives a great resolution ideal for 80 column programs like SAM Desktop and has a green screen mode that is excellent when using a word processor."

? *Thanks for the info, Mr Wright and Daniel.*

MAXIMISING MEMORY

Daniel Baverstock observes that he's "...a great believer in maximising the Atari, so I am curious as to why next to no games or utilities (PD or commercial) use 128K or upgraded computers. There are just as many, if not more, 128K+ Classic Ataris as there are 64K ones, so it would still be profitable to program for the extra memory. Yet they are totally neglected! What's the point in people upgrading their machines if the extra isn't utilised?"

? *Well Daniel, I think we've touched on this subject before; what we have is a 'chicken-and-egg' situation - which came first? People didn't upgrade their machines because there wasn't software to use the extra memory; software companies didn't produce programs that used the extra memory because they would only be dealing with a small percentage of the market because most people hadn't upgraded, and so on ... Are there really more upgraded Ataris than standard ones?*

➡ *Daniel has also* "...been experimenting with DLI horizontal colouring in pictures. this is made possible by loading 62 sector MicroPainter or Koala files into an old NAU (page 6) issue program called Colour Enhancer and adding up to 128 different colours to them. Some of the resulting effects have really got me thinking why, apart from being a standard, all picture files created on art programs are limited to 4 colours. What a waste of colours! I would be quite happy to see art programs with this DLI support as standard, with mouse controlled tools, pull down menus, and many additional features like those already appearing in mono-art programs like SAM Designer. This would be quite possible on 64K machines combined with drives, if not on 128K Ataris. Although SAM Painter has made some headway in this direction with DLI colouring and mouse control, it's still has a long way to go before it's remotely user-friendly. It's mouse control is very jerky, tools are awkward, DLI colouring confusing, and of poor resolution."

? *Correct me if I'm wrong, somebody, but wasn't there a graphics program from Red Rat Software in the U.K. that used DLIs to provide a greater range of colours? It's name escapes me at the moment, but I'm sure some of our artistically-inclined readers will be able to respond ... [It was Technicolour Dream. Ed.]*

VIRUSES

Following M Tomlin's query about Atari viruses, Daniel Baverstock writes that "...there are a few viruses around for the Atari. I managed to find out about three particularly nasty ones, one called 'First blood' and another that acts like a Trojan horse, allowing it to pass the various defences. This information was found in issue 6 of MegaMagazine and Compute!'s Computer Viruses book (although only two pages are dedicated to Atari)."

? *Can anyone add any further info? Are we talking about ST viruses only here?*

BACKING UP DISKS

Eddie Jones of Gillingham, Kent enquires about making disk copies of two programs: "Has anyone come up with an answer to making a working copy of ATARI WRITER, or have I missed it? How can I

transfer HOME FINANCIAL MANAGER, the old THORN EMI program to disk?"

? *I'm not aware of anything other than the commercial program "ChipMunk" which allows you to make a back-up copy of the disk version of AtariWriter; but a reader may be able to supply better information. [There's an advert in this issue for a new drive modification called HyderDrive which may work, but it has not been tested by us. Ed.] With regard to Home Financial Manager, this cassette based program was one of the first released by a U.K. firm when the Atari 400 and 800 first appeared in this country in 1981/82. It was a cassette program but even if you transferred it to disk, I believe that without re-writing sections of the program, you'll find that it will expect to write its data files to cassette. Has anyone experimented in this area?*

PORTUGUESE POWER PROBLEM

Eddie Jones also goes on to say that "Paulo Alexandria Rodrigues of Portugal has had some bad luck. His 130XE gave up a blank screen, no response of any kind. He purchased a 130XE through me, complete with PSU, manuals etc., it had been modified as per Micro Discount's Data Sheet No1. He tested it, all OK. Then he connected everything up, disk drive, recorder, printer - everything OK. Then later he was loading Jump Jet and everything went blank, the same as his first 130XE. The one clue to a possible cause is, he used his original PSU! Trying the PSU I sent, of course made no difference - the damage had been done. Has anyone out there experienced this fault and know of a way of repairing it? Paulo has been a keen ATARI user for over 8 years and is devastated. He will have to give up, having spent money and getting nowhere, so he needs an answer to solve his problem. There is, I am certain an 'egghead' out there who can tell him what to do. He does not know I have sent this letter to MAILBAG. Many thanks in anticipation. We cannot afford to lose members."

? *I'm no 'egghead', but the first thought that strikes me is that there may be a difference between the Portuguese mains supply and that in the UK, resulting in an unexpected/damaging current hitting Paulo's XE - or am I barking up the wrong trees? Over to the more electrically minded of you ...*

AUSTRALIAN COMMENTS

John Stecyk from the Land Down Under has a number of observations:

"In issue 70, you asked what we would like to see in future issues. I wish to see MAILBAG expanded at least another 1-2 pages. The most important part of any hobbyist magazine is the letter column. In the absence of any real news, MAILBAG lends a sense that the magazine is current."

? *Thanks for the encouragement John, but one factor that determines the length of MAILBAG is the amount of correspondence received - if I don't receive letters then you don't get a MAILBAG column. I'm sure any magazine editor will confirm that the volume of mail received reflects only a small proportion of the magazines's circulation. I try to include at least something from every letter received at the Page 6 P.O. Box, and when I complete this issue's column, my file will be empty until I receive a further packet from Les and Sandy. You also have to remember that the gap between the appearance of one issue and the copy deadline for the next is small, so by the time people have read issue 72 and written in and the mail is then passed down to me, I often only have five evenings in which to compile the column and get it sent off, and unfortunately I rarely have five free evenings consecutively so some columns have been close to the wire and a bit ragged at the edges. What's the answer? Maybe send plenty of letters that ask interesting questions or pro-*



vide solid information - letters that make a point (I try to avoid including the congratulatory type letters, I'm sure you're not interested in seeing those in print, although of course I appreciate the sentiments). As for controversial letters - well, if they are intelligent and constructive, let's have them. (End of soapbox)

➾ *John also suggests having material from earlier issues reprinted - this I suspect is another question that Les should answer; I note that back issues are available from issue 32 or thereabouts, and we now have issue disks going back to issue 10.*

➾ *John further enquires about User Groups:* "I'd like to see an article on the remaining User Groups for Atari 8-bits around the world. User Groups could be invited to submit their details (name, contact address, machines supported, BBS, etc.) and perhaps a short overview of their club. If this information was submitted on disk then it would alleviate the effort required to transcribe the information."

❢ *In the past, I believe there has traditionally been limited response from User Groups, but I'm willing to give it a go, so here's a challenge for active Atari User Groups - send us your details, including a short overview and preferably on a 5¼" disk with a printed hard copy and I'll see if I can produce some MAILBAG Specials about User Groups.*

➾ *Finally, John has a question about XF551 disk drives:* "My Australian XF551 works just great with a U.S. Atari computer, but my U.S. XF551 will not work with my Australian PAL computer - does anyone know why? Better yet, does anyone know how to modify a U.S. XF551 for use with a PAL Atari?"

❢ *Can anyone assist? (My first question is how do you tell the difference between an Australian XF551 and a U.S. one? - and that's not the feed for a joke!)*

LACE COMMENTS

I was pleased to receive a copy of the latest LACE (London Atari Computer Enthusiasts) Newsletter and a copy of the minutes of their most recent meeting from their secretary Roger Lacey who may be contacted for more details of LACE at 41 Henryson Road, Crofton Park, London SE14 1HL (phone: 0181-690 2548). Roger's accompanying letter began with these comments:

"I have tried to like the new format of the magazine in its A5 incarnation, but have decided that it is no longer a magazine - certainly nowhere as comprehensive as it used to be, even in the early days. I realise that lack of advertising is a problem, perhaps this could be attributed to cost? In the past my user group enquired of the cost and it seemed just too expensive for the amount of space. Way out of our league in fact. Further, in my mind at least, New Atari User has been degraded to Newsletter level, whereas it is still purported to be a magazine. ST Applications manage a monthly A4 magazine at £1.50. Even 8:16, the Newsletter of BaPAUG, as it was, produced an A4 size magazine, and we at LACE still do, albeit not typeset as such. There seems to be so much missing too. The ST section has dwindled away to just a few pages. There are no large type-in BASIC listings to refer to, and of course the type-face is smaller. I do not like it! Bring back A4!"

❢ *Phew! I gather you're not too keen on the A5 format, Roger ... Seriously, I would like to respond to your comments - and these are my personal views (please remember that I only compile the Mailbag column, and am not involved in the editing and production of the rest of NAU), I'm sure Les will add his own comments as appropriate. You say NAU is "...no longer a magazine ..." and "...has been degraded to Newsletter level ..." - I'm unclear what your definitions of "magazine" and "newsletter" are. You seem to equate page size with status implying that a magazine can only be produced in A4 size, and that anything in A5 size (no matter how well produced) is a newsletter. My personal view is that the only differences between the NAU that was and the current version is the page size, the paper used, and the inclusion/format of listings - honestly, apart from the size is there really any difference between the content of the publication now and its previous incarnation? I can't comment on the cost of advertising - I'll have to leave you to discuss that with Les. I've not seen ST Applications so I can't compare it with NAU (is there someone who can?). You comment on BaPAUG's 8:16 newsletter appearance as a A4 magazine - which is it a newsletter or a magazine? 8:16 also had an erratic publishing schedule. With regard to the exclusion of type-in listings, you should have seen by now that Les has experimented with their reintroduction is issue 71 and hopes to resolve any technical problems encountered. Les also specifically asks me to point out that the type-face used in the A5 issues is NOT smaller than in the A4 issues! (There must be some optical illusion associated with the page size or something ...). Thank you for your feedback, Roger; without such comments the Editorial team don't know if they're doing the right thing. However, occasionally, perceptions my be clouded by misunderstandings of what constitutes the objective of the publication.* [*I won't really add much to Allan's response except to say that I agree with his comments. Surely the difference between a Newsletter and a magazine is that the former is addressed mainly to members of an organisation and contains matters relating to the running of that organisation, like the minutes of meetings, while the latter contains articles and information of a general nature not restricted to the interests of a small group? As to advertising costs, we have always tried to make these competitive with other publications and they have always been lower than any comparable magazine. Perhaps Roger has never enquired of advertising costs in magazines such as ST Format which, last time I enquired, was asking over £1,000 a page. I just wish that we could have got some of that scale of advertising income over the years, even Atari didn't pay that much when they finally placed a full colour double page spread many years ago! Ed.*]

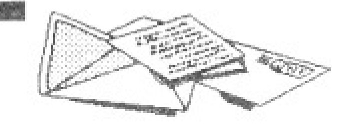
➾ *Roger also sent in some valuable information. First in response to previous letters about Classic Atari power supply units, he adds to the* previous list the following:

Description	Voltage	Current	AC/DC
1010 Cassette	8.5V	0.5A	AC
1020 Plotter	9.0V	3.0A	AC
(1050 supply unit)			
1027 Printer	8.5V	4.2A	AC

"Incidentally, the 850 interface and 1020 plotter pull less than 0.5A from its 3.0A supply transformer so a smaller replacement can be sought if necessary. I have successfully plumbed an extra lead into a 1050 style transformer and it will run both a 1020 and 850 or 1010 and 850 or any combination thereof, safely. Turning off the individual components can be a problem sometimes due to the power switching arrangements when so connected however."

❢ *Thanks for this information, Roger - perhaps you can help Eddie Jones with Paulo's power supply problem elsewhere in this column?*

➾ *Roger continues* "...Peter Kerrison's article on Static Discharge in issue 70. Although fairly comprehensive did make some misleading and incorrect statements in the summary. I will describe what is engineering practise in the small and ever decreasing telecommunications company BT plc. thus: WARNING: When working with static sensitive components NEVER directly Earth (ground) yourself, and NEVER use a conductive work surface. These are dangerous and can be fatal. NEVER use a soldering iron with a grounded tip. Static in this instance is referring to Static Electricity. The nature of electricity is to transfer charge from a higher potential to a lower one. If this transfer takes place quickly, heat is generated and this causes damage. If an item or person is connected directly to Earth, any charged compo-





nent coming into contact will thus discharge its potential quickly, possibly causing damage to the component. In other words it is not just non-conductors that can cause damage. In fact any difference in potential between two items can cause a discharge of static electricity, which can come equally to or from a component and can cause irreparable damage to the minute tracks or components formed within a microchip. Even a single transistor can be fatally damaged in this way and these are generally considered to be robust components.

The solution is to make everything 'leaky' to Earth. The work surface should be insulated but have a conducting sub-surface to equalise charge. Professional anti-static work-mats are constructed in this way. They have metal studs connecting to the conducting sub-surface and allow attachment of anti-static cords. These cords have current limiting resistors of 2 MegaOhms at each end of the cord and can be used both as connections between work-mat and wrist-strap. The soldering iron tip, too, should be connected via a cord to Earth.

We are now talking quite major resistance to Earth, 4 MegaOhms per cord plus the work-mat resistance plus the 4 MegaOhms to the wrist-strap connecting the user to Earth, limiting the leakage current and corresponding Static Discharge to negligible. Certainly a different picture painted here than in Peter Kerrison's summary. Incidentally, the reason the cords have a 2 MegaOhm resistor at each END of the cord is safety. If the insulation breaks down in the middle of the cord while a user is wearing a conducting wrist-strap, he is protected by that 2 MegaOhm resistor.

I do hope you print this if only for the safety aspects of anti-static precautions."

LISTINGS FORMAT

From Sittingbourne in Kent, James Austin sends these comments on the listings format: "On receiving issue 71 of NAU I was surprised to find the changed listing format. Being one of the people who feel the listings should stay with the magazine, I support the change and feel it is necessary if the A5 format is to be continued. However, the new listings are hard on the eye - even a healthy 14-year-old like myself has trouble reading them. Just what are half the inverse characters supposed to be? It is also very difficult to type them in. I have just started typing in 'PLASMA' from the magazine, and I keep on making mistakes and misreading an N for an H, or an L for a 1, for example. Perhaps it would be better to change the listing font altogether, instead of just condensing it down to unreadability? Any way, the listings are going to be harder to read now NAU is in A5 format. Perhaps it would be better to reverse your decision and go back to A4? That way, all these problems would be resolved. Not only is A4 easier to read, but the listings would be easier to read and type-in. I believe that many people would prefer that, even if they had to pay a little extra for a subscription. Perhaps it is about time we had a reader's poll to decide the format of the magazine, and perhaps to see what types of articles and features everyone would want in the magazine? Perhaps we should have an issue about the readers' different uses for their Atari, and what they do with it in their spare time? Perhaps YOU should write an article about what YOU do with it in your spare time? Go on, admit it, even I still play Galaxians! (honestly!) On the subject of Readers' Polls, when was the last time we had one? Perhaps we ought to have one to vote for what we think is the best program/article in Page 6 for 1994, and who has done the most to help the Atari during the year. (Should be interesting!).
Theses ideas are only my opinions, and I am only a small part of the Atari community, but we must all share ideas with each other to keep NAU interesting and informative. It would be nice to know what your ideas are for the future."

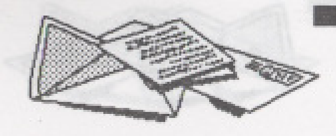
Thank you for your comments, James. Les did say in his editorial in issue 71 that he hoped the new listing format would work, indicating that he would be reviewing the final output. As you've indicated there are problems with the clarity of the inverse characters particularly - it's a good job there weren't any machine code strings included with inverse special characters! I'll have to hand over to Les to comment on the future format and content of the magazine and the possibility of Readers' Polls - a poll only works, of course, if you get a large enough response ... [Well, James as far as the listings go it's about evens. You are the only one to have been exasperated enough to vote against but in a discussion at the recent AMS show another reader said that it worked very well. The problem is one of proportion rather than anything else. In the previous size magazine the listing were reduced to 72% of their original size to fit two columns to a page. To do that with the current magazine would mean reducing to around 50% and that would make them almost unreadable. The alternative would be to use the same size as before but this would waste a 1 inch column on every page and would take up three times as much room in the magazine. The option that I chose was to use a condensed typeface on the printer and use it full size. It is not ideal but I felt that it worked. Also, if you recall, where there was a short program with substantial machine code strings I printed in a much larger size. If anyone has the perfect solution, please let me know. Ed.]

IBM KEYBOARDS

Regular NAU contributor Paul Rixon of Shefford, Bedfordshire sent this information in respect of M Tomlin's recent enquiry about PC keyboards: "The original IBM PC was supplied with an 84-key keyboard. this was based on the standard QWERTY typewriter layout, with numbers on the top row. On the left-hand side there was a bank of ten function ("F") keys and to the right a calculator-style keypad, which doubled up to provide cursor movement ("arrow") keys. This layout was pretty standard until the late 1980s although the IBM AT machines launched in 1984 featured a slightly larger design with lights to signify when the Caps Lock and other toggle functions were operating.
Towards the end of 1986 the "AT enhanced" keyboard standard was introduced. This type is endowed with between 101 and 103 keys, depending on national variations. The number of "F" keys has increased to twelve and they are lined up across the top row, along with Escape and some other functions. The arrow keys and others are separated out so there is no need for awkward doubling up. An additional bonus for touch typists is that the "f" and "j" keys have small ridges to aid location.
There have been several variations on these designs (such as XT enhanced which doesn't have the status lights) but the AT enhanced keyboard is well established as the basic standard. Certain companies (e.g. Amstrad) have tried alternative layouts but they are generally not well received. Microsoft recently came up with an innovative ergonomic keyboard, intended to reduce the risk of repetitive strain injuries.
Although all these keyboards will work (to some extent) with just about any PC, the only complication is that there are two kinds of connector. The 7-pin Din type referred to by Mr Tomlin is very common but some manufacturers use a smaller 6-pin "PS/2" connector which originated with IBM's PS/2 machines. If you end up with the wrong sort, you can buy a converter plug to make amends. Finally, if you find that some keys produce the wrong characters then you probably need to tweak the KEYB line in your AUTOEXEC.BAT file - but I won't go into that now!"

There's more! ☞





BEATING BRUNDLES

Reginald Hatch of Datchet in Berkshire has tried to follow the Tipster's hints in issue 71 to modify his BRUNDLES' Level disk, but the program he has used to make a back-up copy (Super Duper - Callisto PD#18) allows him to copy the disk, but the disk editor supplied on that PD disk only caters for single density disks, i.e. up to sector 720, so Reginald is unable to modify sector 831 as per the hint. Can anyone recommend a sector editor that copes with enhanced/double density disks?

Finally, I made a brief mention of PC Xformer (software that allows you run an Atari 8-bit emulation on a PC) in last month's column. Since then I found a copy of the PD version of this on the CD-ROM cover disk of one of the many newsstand PC magazines. I had an interesting evening using an Acorn A4000 fitted with a PC card to copy the files from the CD-ROM to the Acorn's hard disk PC partition and then in PC mode running the demos included via the PC Xformer utility. It was quite a pleasure to see the familiar blue screen with READY prompt and the DOS 2.5 menu appearing on the monitor of the Acorn which was emulating the PC which was now emulating the Atari 800! This could well be the future for the Atari Classic. By my estimates you should be able to get about 16 single density Atari 5¼" floppies onto a single IBM-format 3½" HD disk. Dave Ewans from TWAUG tells me that he has successfully used the commercial version of PC Xformer to run such things as Print Shop from the PC. Has anyone else out there made their PC a new home for their Classic Atari? [By a strange quirk of fate there may well be a review of PC Xformer in this very issue. Has Allan also been listening to the same music again this time? Could this be another case for the X-Files?. Ed.]

Air your views on all things Atari or help your fellow users with their queries - even ask for help yourself. It's all interesting, if only you write it down. Here's the address:

MAILBAG
NEW ATARI USER
P.O. BOX 54, STAFFORD
ST16 1TB

Features and OPINIONS

UPGRADES WHY BOTHER?

Daniel Baverstock takes a somewhat surreal look at upgrades. Last time he asked 'Why bother?' he came up with a convincing argument in favour of demos but will it be the same with upgrades?

In the distance, obscured by countless ruined stone statues slowly crumbling from neglect, stood a lonely figure. The sand-laden wind whistled around his feet and through loose clothing. Every so often tatty rags wrapped around his scrawny frame so tightly that his shadow was almost non-existent in the path of the harsh sunlight. Balanced upon his long, weary arms was an enormous metallic globe, with a small tag dangling from it inscribed with the numeral 64. He'd been stood there for so many years now, he'd almost forgotten his own name, but was reminded periodically every time his eyes glanced towards a nearby stone with one letter 'K' chiselled into it.

'K' (abbreviated to - er, well - 'K'!) as you have probably gathered by now, was scrawny, dressed in rather weather beaten garments, and to top everything, extremely bored! His age was, and had been for god knows how long, 64. He knew this for, as with his name, it was also inscribed on another nearby stone. This particular day he'd woken up unusually late, due to the fact that the huge 100-tonne globe hadn't toppled off his outstretched arms and squashed him flat until much later than usual.

K, drowsy after a particularly bad night's sleep, pulled himself from under the globe, lying back for a while. Standing up a few minutes later, he shuffled closer to the globe, bending over as he prepared his sore back for the first attempt at bringing it back to its rightful place. As usual, K braced himself and tugged upward; a large bone crunching crack reminded him of the hazards of this lifestyle.

On the second attempt K managed to bring the globe upon his knee when the words *"Good afternoon"* in a rough voice startled him. This sent the giant globe off down a sandy dune, killing a small spiky rodent who had been unfortunate enough to pop out of his burrow to see what the commotion was all about.

K hadn't heard a voice for so long, and turned around. A very large, fat pedlar stood close by, trailing behind him a rickety old hand-drawn cart. *"Good afternoon"* repeated the pedlar. *"Can I interest you in anything on my cart?"*

K, startled and overjoyed to actually see someone else, poked the fat pedlar to make sure he wasn't a mirage. Opening his mouth,

K spluttered *"Wo are yo?"* It had been so long since he'd had occasion to speak that he'd forgotten how to.

The pedlar waddled over to the other side of the cart which was brightly decorated in gold lettering with words like **'Upgrades'**, **'hardware'** and **'software'**. With a quick press of a lever, the cart unfolded with cranks and groans, increasing in size until it was no longer a cranky wooden cart, but a cranky wooden store.

The fat pedlar walked through a door in the side, and holding it open, beckoned to K. A small spikey rodent appeared at K's feet, jumping up and down and jabbing its paw at the other expired, rather flat rodent attached to the globe as it thundered down the side of a sand dune a few hundred yards away.

The pedlar stopped, swinging his arm in front of him as if a welcome gesture to peruse the store. Shelves and shelves of items stretched as far as K could see, which incidently wasn't too far since his bi-spectacles had been crushed aeons ago.

K approached a stack of items and picked one up. An electronic voice read: *DTP package, 256K required*. He picked up another, and pressing a blue button on the side was greeted by *"Upgrades, the answer to your problems. Fed up with your program potential being restricted to a pitiful 64K? Want to see more 128K and 256K programs, menu-driven Desktop publishing and word processing software, sample sequences and sampled sounds? Contact 'Quarx Developments', 65 Norbuewnard Place, Arkwander, BBBRRRRRR.."* The pedlar stepped in, grabbing the package. *"Damn stock, the battery's gone, ah well"*.

In the corner of the store, a large metallic globe, similar to that which, unknown to K, was presently piling through a small rodent village a mile away, caught K's eye. As he hobbled towards it, a few others came into view. Each was strapped onto the wall and had its own marking - 128, 256, 512, 1MB. Beside them was a console which powered up as K approached its screen.

"Hi there, what would you like to know?
Please state your desired choice:"

Memory Upgrades	Stereo Sound Upgrades	Drive Upgrades
128K	Pokey stereo upgrade	810/Super Archiver II
256K	Stereo plus upgrade	810/1050 Happy
512K		1050 US Doubler
1MB		XF551 Speedy upgrade

K mumbled *"Memory upthgrades pleath"*, his speech a little more comprehensible.

The console, pausing momentarily to process K's rather confusing response, finally proceeded. "Upgrades - allows your machine extra RAM capacity enabling software with more potential. Example: Mouse-driven drop-down desktops, word processors, desktop publishers, art programs, sampled music and sound effects, more detail, colour and special effects, and bigger, more involving games with character animation and animated sequences."

The console display disappeared momentarily, then reappeared with information about upgrades. The fat pedlar sat on a nearby chair which collapsed under him. He sighed and looked on ...

Upgrades available:

Wizztronics	256K for 800XL
Rambo	256K for 800XL
320K	for 65/130XE
1MB	for 65/130XE

Machines currently available with enhanced memory capabilities:

130XE	28K RAM

Current software utilising 128K +

Brundles	Only saving many levels to memory. Gameplay still runs on 64K base memory
T-34 The Battle	128K sampled sound & animated intro sequence
Megablast	2 player PD, utilizes extra 64K for sampled music
Hi-res Picture dump	128K
Snapshot	Multi-tasker - up to 256K
Atari-Writer Plus	64K& 128K versions
MYDOS 4.5	256K version

Video Blitz, Shiny Bubbles and Compy Shop demos, Dancing Lady demos
plus many more ....

Many applications use advanced compression techniques to utilise the extra RAM expansion."

K turned his attention away from the console and towards the fat pedlar who had fallen through the wooden floorboards, and was stuck. Used to lifting 100-tonne globes, K attempted to pull the fat pedlar out of the hole, soon realising he weighed more than the globe. *"Never mind"*, chuckled the fat pedlar. *"I'm quite comfortable. Care to buy anything?"*

K pondered over this, and after reaching in his pocket, luckily the only one without a hole, he dragged out a limp wallet and peered inside. To his surprise, a £50 note lay intact. Prying it away from the wallet, which instantly fell apart, he walked over to the globe marked 128. *"I'll take this one"* K said miraculously, in such a clear voice you'd imagine he'd been sucking on a Tune throat lozenge for the past year!

"OK, leave the money by me" chuckled the trusting fat pedlar. *"I'll take this these as well"* K said as he took a new Desktop publisher package, a mouse and a new desktop system off the shelves.

The pedlar, gradually disappearing from view, pointed towards a contraption the other side of the store, not unlike a tennis ball launcher, only 8ft tall. *"I'll throw that in as well"*. *"What is it?"* K said, not sure whether to be pleased or worried as 'it' looked up at them both with two red lights, and appearing to be offended at being referred to as 'it'.

The pedlar replied *"Oh, that's Yod, he's a droid. He never does much round here since we don't have many customers."*

"Er, yeah, thanks, I'll have him then", said K as he placed the £50 note by the pedlar and walked towards the door. *"Bye then"* shouted K, waving as he stepped out the door, Yod the Droid closely trailing behind him, carrying K's bargains. As Yod approached the door, his arm, (a large metallic rod with something closely resembling a lettuce colander attached to the end), caught a lever. With almighty creaks and groans (one or two undoubtedly coming from the fat, but now quite flat, pedlar), the store folded in on itself, resuming its old form as a cart.

Fate then dealt the flat pedlar and his cart a second blow as the huge metallic globe came over a nearby sand dune, crushing the cart as it passed through. *"What an eventful afternoon"* said K. He then had an idea. Lifting the new 128 globe onto Yod's head, he instructed Yod to stand still. *"At last, I can put my feet up"* said K, lying against a statue.

For the first time in his 64 years of, well, being 64 years old, K realised he could relax. He had his upgrades, his new software, and no more of the hassles of holding that damned heavy 64 metallic globe. The breeze whispered around K as he fell into a deep, well-earned rest.

K lives a quiet life nowadays. Every so often he is woken from deep tranquil slumber by the sound of squelching rodents who frequently cross the path of the huge globe, but otherwise life is peaceful.

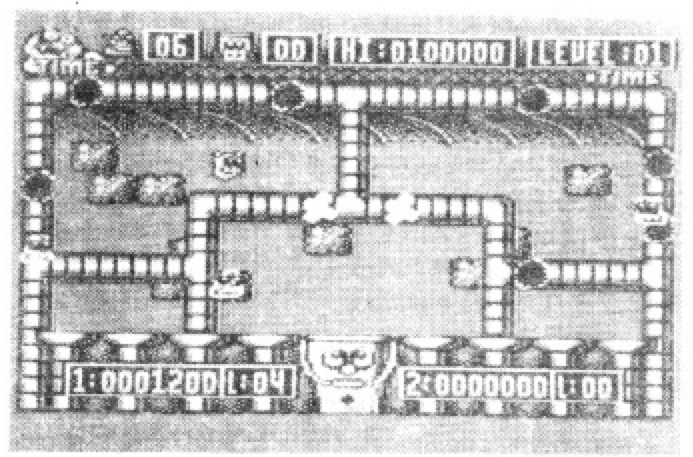
And the moral of this tale is, (just in case you haven't understood this intricate story), that upgrades give the Atari so much more potential. If you don't utilise extra RAM upgrades when they are available (130XE) and use 64K only, you are missing out on some wonderful software opportunities.

The same goes for extra storage available from upgraded drives, improved stereo sound upgrades, and new developments such as the 720K drive interface from Micro Discount. This allows between 360k and 720k storage capacity to be utilised from 5¼" and 3½" drives respectively. Just imagine game possibilities with so much storage space on just one disk!

T-34 - the battle is one of the first commercial games currently available to use 128K in full gameplay, incorporating sampled sound and an animated intro screen. I hope it's just the beginning.

This article is dedicated to my father, who died at the beginning of May. ***D.B.***

TUBE BADDIES



It's long been known that several high quality games were produced for XL/XE machines but were never released, simply because the copyright holders ditched their support for the 8-bit before they had committed funds to the full-blown production and marketing effort. TUBE BADDIES, by well known Atari software authors Ivan Mackintosh and Richard Munns, is one such game apparently 'owned' by Atari Corporation but shelved when the company decided to abandon its commitment to 8-bit computing. The good news is that Richard Gore (who has also rescued Jawbreaker and MouskAttack from the authors' archives) has tracked down the publishing rights and duly become the official distributor of this long lost game.

The premise of the game is a tad surreal, and also quite amusing. All told, the Tubular Underworld (more tubes here than a place with very many tubes indeed) has fallen into disrepair, so the Underworld's two resident handymen - known as Bip and Bop - have been called in to put things back into working order. Bearing in mind the imminent arrival of the Big Inspector on his annual inspection of big things that need to be inspected, Bip and Bop would be ill advised to stand around and gossip! What they don't know - or rather, what they only find out upon arrival in the Underworld - is that peculiar life forms known as Tube Baddies have infested the pipe network and are merrily causing a great deal of havoc. Conveniently armed with a stunningly effective Stun Gun plus a waste bucket called Barny (The Bucket), Bip - with the optional assistance of Bop, assuming you can find a second player to assist - sets off on a mission to blast the baddies, patch up the pipes and keep on good terms with the Big Inspector.

Each level of the game presents you with a new screen of tubes, scenery and bonus objects. You can move your handyman in any direction over the playfield, which is just as well since it's essential to avoid harmful contact with the Tube Baddies. You can patch up holes in the pipes by hitting the trigger when positioned over a damaged section. To prevent the Baddies re-offending you need to knock them out with a blast from your stun gun. Once dazed they adopt a more predictable pattern of movement - with one or two further successful hits you can guide these wasters into a collision course with Barny (The Bucket) for permanent disposal. Providing you repair all the pipes before the countdown timer reaches zero, extra points are awarded for a bucket bonus, which corresponds to Barny's contents.

The first few levels are easy enough but, naturally, as the game progresses the difficulty factor increases. A greater quantity of Baddies with a more destructive disposition is only to be expected, but you also have to contend with bubble gum and spider's webs intended to hinder your speed of progress, solid walls that can't be crossed by the handymen and electric cables that have to be approached with extreme caution. The game features various other objects too and collecting these may or may not prove to be advantageous.

Despite the game's relatively simple concept, its graphics have been well constructed. There are some nice touches including cartoon-style animation of Barny's face. An attractive title page and highscore table add a professional finish to the presentation. The music is, as you might expect given the authors' previous achievements, good stuff. It plays throughout and helps to add a sense of urgency to the task.

Needless to say, Tube Baddies is an excellent game and would undoubtedly have sold very well had it been released several years ago, when Atari software could still be purchased from a variety of commercial suppliers. Alas, it was not to be. Due credit must go to Richard Gore for his initiative in reviving an otherwise forgotten program. How many more top-notch games are hiding in authors' attics?

Title:	**TUBE BADDIES**
Publisher:	Richard Gore
Supplier:	DGS
Format:	Disk
Price:	£4.95

Reviewed by Paul Rixon

DISK BONUS

THE STARS DATABASE

by Johnny Chan

If you are expecting a program on astronomy, read no further for these are not the stars in the heavens but the stars of stage, screen and football field!

The program contains over 400 birth dates from Bruce Forysth to Macaulay Culkin and from stars of Home and Away to Neighbours! There are also stars from Eastenders, Coronation Street, the pop industry and the world of film and television. You can search for anyone who was born in a particular year, any month or even those who share the same birthday as you. You can also search for occupations or find out how old a particular star is, to the nearest day!

If you are not satisfied with the stars already included a creator program allows you to add your own information to the disk. Why not mix your family and friends in with the rich and famous?

Full instructions for this program and the creator are on this issue's disk.

THE STARS DATABASE is the BONUS on the Issue 72 disk which disk subscribers will receive with their magazine. The disk is also available separately for just £2.95 from PAGE 6, P.O. BOX 54, STAFFORD, ST16 1TB. You may order by telephone on 01785 41153 using your Access or Visa card.

THE ISSUE DISK OFTEN CONTAINS ADDITIONAL BONUS PROGRAMS NOT MENTIONED IN THE MAGAZINE

COUNT ON IT!

Everyone can count in tens but with computers you need to count in different ways. Ann O'Driscoll explains how

The two programs here give a simple demonstration of the relationship between decimal, binary and hexadecimal numbers. In the first program, the computer cycles up or down between 0 and 255 when you press the arrow keys and shows each number in its decimal, binary and hexadecimal forms; the second program displays any decimal number input by the user in both binary and hex.

The decimal or BASE 10 counting system is the one we use every day. We rarely if ever think about how it works, because we add, subtract, and so on "automatically". If you do stop and think for a minute though, you will notice that the highest "single" number is 9 and each digit is worth 10 times more than the digit to its right: For instance the decimal number 19 is made up of 1 ten (1 x 10) and 9 units, "62" is made up of 6 tens (6 x 10) plus 2 units, while the number 234 is made up of 2 hundreds (2 x 10 x 10) plus 3 tens (3 x 10) plus 4 units. We call the system the "BASE 10" system because the values of the digits go up by a factor of 10 from right to left.

The same principle works with binary or BASE 2 counting. This time, the highest number in use is 1 and each digit is worth 2 times more than the one to its right: For instance, the number 11 in binary represents 1 x 2 plus 1. This is equivalent to 2+1=3 in decimal; the binary number 1011 works out at 1 x 2 x 2 x 2 plus 0 x 2 x 2 plus 1 x 2 plus 1, or 8+0+2+1 = 11 in decimal. The binary system is, of course, central to computing: Computer circuits are called binary digit circuits or "bits" because they have only got two states: Off = 0 and On = 1. A "byte" is simply a group of bits; the "8 bit" Atari computers organise their bits in groups of 8, hence the name.

A quick way of converting an 8 bit binary digit to decimal is to put the following numbers, which represent increasing powers of 2, in a row:

128 64 32 16 8 4 2 1

and then put the binary number underneath, with a "0" or a "1" under each decimal number. Add up the decimal numbers which have a 1 underneath to get the answer. Some examples are:

128	**64**	**32**	**16**	**8**	**4**	**2**	**1**	
1	1	1	1	1	1	1	1	= 255
0	1	0	0	1	1	0	0	= 76
0	0	0	0	1	0	1	1	= 11

Anyone who has tried their hand at redefining character sets will, of course, be familiar with this process. Some common combinations - like decimal 255 for binary 11111111 - will be remembered easily once you do them a few times.


```
GJ 100 REM BIN-DEC-HEX: LISTING 1
SO 109 REM -- SCREEN DISPLAY
TZ 110 GRAPHICS 0:POKE 710,0:POKE 752,1:N
   UM=0
VR 120 POSITION 1,2:? "BINARY      ":POS
   ITION 1,8:? "DECIMAL      ":POSITION 1
   ,13:? "HEXADECIMAL "
AC 130 FOR R=15 TO 17:POSITION 20,R:? "|"
   :NEXT R
YR 140 POSITION 1,20:? "PRESS UP/DOWN ARR
   OWS OR Q TO QUIT":GOTO 220
UE 149 REM -- WAIT FOR KEYPRESS
IQ 150 IF PEEK(764)<>14 AND PEEK(764)<>15
    AND PEEK(764)<>47 THEN 150
RZ 160 IF PEEK(764)=47 THEN POKE 764,255:
   GRAPHICS 0:POKE 752,0:END
CQ 199 REM -- ADD OR SUBTRACT 1 FROM NUM
HW 200 IF PEEK(764)=14 THEN NUM=NUM+1:IF
   NUM=256 THEN NUM=0
YM 210 IF PEEK(764)=15 THEN NUM=NUM-1:IF
   NUM<0 THEN NUM=255
DJ 220 POKE 764,255:POSITION 20,8:? NUM;"
   ";
RH 229 REM -- DECIMAL / BINARY
GF 230 N1=NUM:D=128
JC 240 FOR COUNT=0 TO 7
CD 250 N2=0:IF N1>=D THEN N2=1:N1=N1-D
KH 260 POSITION 5*COUNT+1,4:? N2:POSITION
    5*COUNT+1,10:IF N2=1 THEN ? D:GOTO 28
   0
TV 270 ? "0  "
QD 280 D=D/2:NEXT COUNT
ZR 299 REM -- DECIMAL / HEX
UU 300 HI=INT(NUM/16):HI2=HI+48:IF HI>9 T
   HEN HI2=HI2+7
BG 310 LO=NUM-HI*16:LO2=LO+48:IF LO>9 THE
   N LO2=LO2+7
KJ 320 POSITION 19,14:? CHR$(HI2);" ";CHR
   $(LO2)
YS 330 N1=NUM:D=8
GE 340 FOR COUNT=0 TO 3
ZC 350 N3=0:IF HI>=D THEN N3=D:HI=HI-D
DN 360 N4=0:IF LO>=D THEN N4=D:LO=LO-D
CN 370 POSITION 5*COUNT+1,16:? N3:POSITIO
   N 20+5*COUNT+1,16:? N4
TZ 380 D=D/2:NEXT COUNT:GOTO 150
```

Listing 1 - Equivalents of numbers up to 255 in different counting systems

To convert a decimal number into binary, you just continuously divide by 2 until there's nothing left. The remainders after each division are the binary digits, working from right to left. For example, decimal number 76 is converted as follows:

76/2	=	38 + 0	- lowest binary digit
38/2	=	19 + 0	- second binary digit
19/2	=	9 + 1	- third binary digit
9/2	=	4 + 1	- fourth binary digit
4/2	=	2 + 0	- fifth binary digit
2/2	=	1 + 0	- sixth binary digit
1/2	=	0 + 1	- highest binary digit

The binary equivalent of 76 is therefore 1001100.

There is no problem with counting in a base greater than 10 either. In fact, we use BASE 60 all the time without thinking about it, when we measure time. For instance, we might express 130 minutes as 2 hours 10 minutes, having mentally "carried" each 60 minutes into the hours column. We automatically change seconds into minutes the same way. From the computing point of view, the HEXadecimal or BASE 16 counting system crops up a lot, especially in assembly language. In this system each digit is worth 16 times more than the one to its right. The numbers range from 0 to 15 and we use a new notation for numbers above 9: these are represented by the letters A to F (10=A 11=B,

```
HO 100 REM  BIN-DEC-HEX: LISTING 2
BM 102 REM ┌─────────────────────────┐
LR 103 REM | DELETE LINES 140 - 220 OF |
HO 104 REM | LISTING 1 AND PUT IN LINES|
TN 105 REM | 140 - 170 SHOWN HERE. THE |
EB 106 REM | REST OF THE PROGRAM IS THE|
WM 107 REM | SAME AS LISTING 1         |
CL 108 REM └─────────────────────────┘
SO 109 REM -- SCREEN DISPLAY
TZ 110 GRAPHICS 0:POKE 710,0:POKE 752,1:N
   UM=0
VR 120 POSITION 1,2:? " BINARY        ":POS
   ITION 1,8:? " DECIMAL        ":POSITION 1
   ,13:? " HEXADECIMAL "
AC 130 FOR R=15 TO 17:POSITION 20,R:? "|"
   :NEXT R
EN 140 POSITION 1,20:? "INPUT NO. 0 - 25
   5 [999 TO END]: ";
MM 150 TRAP 140:POSITION 34,20:? "   ";:P
   OSITION 34,20:INPUT #16;NUM
BV 160 IF NUM<0 OR (NUM>255 AND NUM<>999)
    THEN 140
LM 170 IF NUM=999 THEN GRAPHICS 0:POKE 75
   2,0:END
DJ 220 POKE 764,255:POSITION 20,8:? NUM;"
   ";
RH 229 REM -- DECIMAL / BINARY
GF 230 N1=NUM:D=128
JC 240 FOR COUNT=0 TO 7
CD 250 N2=0:IF N1>=D THEN N2=1:N1=N1-D
KH 260 POSITION 5*COUNT+1,4:? N2:POSITION
    5*COUNT+1,10:IF N2=1 THEN ? D:GOTO 28
   0
TV 270 ? "0  "
QD 280 D=D/2:NEXT COUNT
ZR 299 REM -- DECIMAL / HEX
UU 300 HI=INT(NUM/16):HI2=HI+48:IF HI>9 T
   HEN HI2=HI2+7
BG 310 LO=NUM-HI*16:LO2=LO+48:IF LO>9 THE
   N LO2=LO2+7
KJ 320 POSITION 19,14:? CHR$(HI2);" ";CHR
   $(LO2)
YS 330 N1=NUM:D=8
GB 340 FOR COUNT=0 TO 3
ZC 350 N3=0:IF HI>=D THEN N3=D:HI=HI-D
DN 360 N4=0:IF LO>=D THEN N4=D:LO=LO-D
CM 370 POSITION 5*COUNT+1,16:? N3:POSITIO
   N 20+5*COUNT+1,16:? N4
TZ 380 D=D/2:NEXT COUNT:GOTO 150
```

Listing 2 - How to amend the first program to enter any number

12=C, 13=D, 14=E and 15=F). For example, 36 in Hex is equal to 3 x 16 plus 6, or 54 (48 + 6) in decimal; 9F in Hex equals 9 x 16 + 15 = 160 in decimal.

While at first glance it may seem that Hex is just another base, there is, in fact, a very close relationship between the Base 16 and the Base 2 systems. Each group of 4 bits in binary represents a hex digit. Therefore, you convert from Binary to Hex by splitting your byte up into groups of 4 and considering each part separately: In an 8 bit byte we would have two groups - The 4 lowest bits, which may reach a maximum of 15 in decimal, represent the righthand hex digit. The 4 highest bits, which are needed when numbers reach 16 or more in decimal, represent the lefthand hex digit. For example, the byte 10011110 is made up of 1001 (= 9 in decimal) and 1110 (= 14 in decimal); this is equal to 9E in Hex.

Just as it is possible to convert a decimal number into binary by successively dividing by 2 until there's nothing left, you can convert from decimal to hex by continually dividing by 16. This time the remainders after each division are the hex digits, working from right to left. For instance, the base 10 number 1234 is converted as follows:

1234/16	=	79 + 5	lowest hex digit = 5
79/16	=	4 + 15	next hex digit = F
4/16	=	0 + 4	next hex digit = 4

Our hexadecimal equivalent of 1234 is, therefore, 4F5. Converting from hex back to decimal is straightforward too - just remember that each number is worth 16 times the one to the right and add the answers. For instance, ABC in hex is equal to 10 x 16 x 16 plus 11 x 16 plus 12: 2560 + 176 + 12 = 2748 in decimal. In an 8 bit byte, the highest hex number will, of course be FF, or 15 x 16 plus 15 = 255 in decimal. To change FF into binary we take each digit in turn: The lefthand F is 15, or 1111 in binary. The righthand F is also 15, giving us 11111111 in all - the highest binary number possible in an 8 bit byte.

Of course, in reality you don't have to bother working all the conversions out at all, as the listings here do them for you. I hope the above account of the relationship between the 3 counting systems helps to explain how the programs work. ●

HEY! HEY! it's

The TIPSTER

You know, I am beginning to get worried now. After all, how long does a Tipster live for? Being the first of his kind and having undergone at least three incarnations I am beginning to wonder whether this incarnation will be it. You see, I am not getting much sustenance nowadays, in fact only one measly tip (well two in one letter) since the last issue and a Tipster can't go on like that. Maybe you are all tipped out? Maybe you just haven't got round to writing. Maybe you have already sent in every possible tip on every game you have ever played (doubt it). Whatever the reason for the lack of Tips, do something about it for me. I just want to see another Christmas!

REVISITING THE CITADEL

Joel Goodwin has advised that our recently printed list of passwords for The Citadel is incomplete. The last two passwords are

24 - EARTH
25 - TOUCH

There is no password for room 26 but you are given infinite time and attempts for it.

Thanks to Joel. How did he get to levels 24 and 25? Easy, he wrote the game!

GO ON - LEGGET!

Jason Kendal has sent in quite a few tips before and in response to an earlier request has this little gem for LEGGET

1. Start on 2 player mode and when 1 player dies use the other one!
2. Turn the music off during the game *(I don't know if this actually does anything or whether Jason just doesn't like the music!)*
3. Always wait for holes to cross over on level above before jumping up

THE CURSE

Mrs Morris of Eastbourne has some hints on **THE CURSE OF CROWLEY MANOR.**

Drop the growth on the table in the dining room, then go North into the pantry. Wait before returning to the Dining room to the south. The growth will knock the cupboard over trying to escape and will expose a letter opener and axe. Leave the axe until you come back. Take the letter opener to the parlour where you can open the writing table to find some helpful clues.-

ORSON

Bet you haven't got to the end of our DISK BONUS for Issue 71, have you? Well, if you want to see the end animation without playing all the way through (that is, if you want to CHEAT!), author Joel Goodwin has let us in on the secret.

On the title screen press J followed by SHIFT-7 (i.e. the apostrophe). You should now see the end of game animation.

SPELUNKER

Rob Bowran of Cheltenham has the information to complete the first two levels of the golden oldie **SPELUNKER**. Pick-up the objects in the following order to complete the "elevator" and "ropes" levels.

Key: **W**-Go down one tunnel. **F**-Flare. **D**-Dynamite. **E**-Use dynamite to proceed past obstruction. **L**-Return to lift. **P**-Power. **X**-Extra life. **BK**-Blue key. **GK**-Green key.

Elevator level:

W W W F D P L W E P X P BK D P L W D P TRAIN E P BK L W P L W F F BK D P F X P L W W W D P L W DOOR E P F D P

Ropes level:

Bridge F Bridge P F Cross ropes Door F X E P F GK Cross ropes F D Doors BK D E P

CRYSTAL CASTLES

Keith Hughes of Blitterchips fame has got himself hooked on the ROM cartridge **CRYSTAL CASTLES** and has come up with a full expose which should help you live long and prosper (or at least get you a bit further into the game). If you are playing for the first time, let the demo screens run through, This will give you a preview of some of the thirty-seven screens you may encounter along the way. Wherever possible, collect the gems from the highest platforms and towers first whilst the Gem Eaters are busy. Use the Magic Hat only as a last resort or to kill Berthilda the Witch. You may need it to help you complete particular screens so leave it till last. To start the game at the highest level allowable use the secret warps to get you to level 7. Survive until the second screen on level 8 then die. Restart the game and use the warp door on screen 1 level 1 to warp back to level 8 with all your spare lives intact. Note: You must be good to start from level 8 and very good if you are to reach level 10.

THE SECRET WARPS

There are a total of 3 secret warps which can take you from levels 1 to 3, 3 to 5 and 5 to 7. Do not be fooled into thinking that this is an easy way to get you nearer to level 10 without doing any hard work. In particular level 6 can prove good practice since it can be as demanding as level 9.

WARP 1 (the easiest) Screen 1 level 1. Go to the farthest corner, i.e. where there are no gems. Use the outside path. When at the back, in the corner, jump. This will take you to level 3. ***WARP 2*** (the hardest) On the first screen (HIDDEN RAMP). *Method 1* - as the Gem Eaters land, jump over towards the tree. You should automatically pick up the Magic Hat, get on the elevator. When you are on the higher level make your way down the centre (hidden) ramp. When in the corner jump. You must be wearing the hat at this point. *Method 2* - make your way to the higher level by way of either the left or centre elevators. You are now relatively safe with time to think. Go around to the top of the right side elevator. If careful you can temporarily trap the tree diagonally behind you as you come down the elevator. Run! Get the Magic Hat and proceed back up the elevator as in method 1. Now you are on level 5. You must survive until screen 3 (CROSSROADS). Again, there are two methods. The easy, or quick, route is to run up the right hand side, jump over the Honey Pot etc. You should automatically engage the Magic Hat. This will protect you while you go up the elevator, go left and in the corner - jump. It's as simple as that. Alternatively, go left, wait, entice the tree down the ramp, now go back to the elevator to the high level ramp and continue as above. You can entice the tree down the elevator then run up the ramps instead if you wish. The Magic Hat is not required for this warp.

That's it!

Send your hints, tips, maps, questions, solutions (anything!) to

THE TIPSTER
NEW ATARI USER
P.O. BOX 54
STAFFORD
ST16 1DR

Do it when you like but do it quickly!

DISKS AND DOS

You probably use disks all the time but do you really know everything about them? John Foskett explains all

A floppy disk is a thin ferric oxide coated plastic film permanently housed in a square casing in which it rotates when in use. Data is written to a disk in the form of signals in exactly the same way as signals are recorded onto an audio or a video cassette. The way that signals are recorded to and read from a magnetic surface, whether tape or disk, requires an understanding of physics and electronics which is far too involved to concern ourselves with here. In this article we shall only concern ourselves with the software configuration of the floppy disk as it applies to the Atari classic.

A floppy disk is based upon a 40 track configuration which could be visualised as 40 concentric circles around the centre of the disk where each track is divided into a fixed number of segments. A disk formatted in single density has each track divided into 18 segments or "sectors" whilst an enhanced density disk has 26 sectors per track.

Naturally, the sectors contained on the innermost track are smaller in length (or arc) than those of the outermost track, therefore data stored in the innermost track is more compressed. This, in effect, limits the density of a disk to whatever the innermost sectors can cope with.

THE DISK SECTORS

A disk formatted using DOS 2.5 in single density has a maximum of 720 sectors (40 tracks x 18 sectors) whilst a disk formatted in enhanced density contains a maximum of 1040 (40 tracks x 26 sectors). No matter whether single or enhanced density is considered, the disk always contains 128 bytes in each sector of which only 125 can be used for storing data. Using a scale of 0 to 127 to label the bytes in each sector, the last three bytes, labelled 125 to 127 are used by DOS for its own purposes.

SECTOR LINKING

DOS uses a "daisy chain" method of keeping track of all the sectors used in each file on the disk so that the file name entry in the directory needs only to give the address of the first or starting sector of a file. Once the starting sector has been located, it is just a matter of DOS following the daisy chain to locate the next sector and then the next and so on until the last sector has been reached. In the daisy chain, each sector of a file gives the address of the next sector in the sequence which is stored in bytes 125 and 126 in a special way. The actual address for sector linking is stored using the two lowest order bits of byte 125 and all of the bits of byte 126 in order to make up 10-bit binary number. The sector link address is calculated as follows

```
HI=INT(BYTE125/4): LO=BYTE125-HI*4:
SECTORLINK=BYTE126+LO*256
```

(In all the examples, BYTExxx is assumed to be the value stored in BYTExxx)

Since 255 is the maximum value that can be stored in an 8-bit byte and 3 is the maximum value that can be stored in two bits, then it follows that the maximum value that the variable SECTORLINK (above) can contain is 255+3*256 or 1023.

Therefore sector 1023 is the highest sector on a disk that DOS can access and hence the reason why you cannot access more than 1024 sectors in enhanced density even though there are 1040 sectors available. Because the highest sector that DOS can access is 1023, it becomes obvious why sector 1024 was allocated for the second VTOC sector when Atari first designed the enhanced density system.

Although sectors 1025 up to 1040 cannot be accessed by DOS, there is no reason why these 16 otherwise unusable sectors cannot be used for storing data by accessing them directly. They could be used for example, by a game program which stores a hi-score table. In most cases it is not important that these 16 sectors do not have VTOC protection, but if a program was to access them for read and write, then there is no reason why they could not be protected within the VTOC by making use of some of the VTOCs unused bytes.

INTEGRITY CHECKING

This is a check which is only performed when a deleted file is being restored and is based upon the fact that every sector used in a file contains the address of its own file name entry in the directory. Whenever a file is written to a disk, the address of the file name entry on a scale of 0 to 63 is written to each of the files sectors, where 0 is the first file, 1 is the second, etc. The file name entry address is stored using the 6 highest order bits of byte 125. Thus going back to the calculations for SECTORLINK, it can be seen that the variable "HI" contains this address, since dividing BYTE125 by 4 and taking the integer of it gives the value stored in the six highest order bits.

The maximum value that can be contained in a 6-bit binary number is 63, hence 0 to 63 or 64 addresses. This is the reason why the maximum number of files that can be contained on a DOS 2.5 disk is 64. The calculation then becomes

```
CHECK=INT(BYTE125/4): LO=BYTE125 -
CHECK*4: SECTORLINK=BYTE126+LO*256
```

where CHECK is the integrity check file name address and SECTORLINK is the

address of the next sector in the file.

In order to successfully restore a deleted file, each of the files sectors must contain the address of its own file name in the directory. The integrity check is said to fail when a sector is found in the daisy chain that does not contain the deleted files address. This may be the case when a file has been deleted and another file written to the disk afterwards which may have "stolen" some of the deleted file's sectors. In this case a deleted file cannot be restored.

DATA STORAGE RECORD

A record of the amount of data stored in each sector is stored in the last byte of the sector, that is byte 127, where the value will always be 125 for all but the last sector of a file. When examining a well used disk with a sector editor, it can be seen that the last byte of the sectors will nearly always contain 125 (7D in hexadecimal or the clear screen arrow character).

THE DIRECTORY

A disk's directory is made up of eight sectors each containing eight directory entries. The directory sectors are 361 to 368 which is a mid-way position on a disk between the first and last sectors of a single density disk. This means that wherever a file's sectors are on a disk, the directory is no more distant than halfway across the disk. The directory is actually at the beginning of track 20.

Each entry in the directory uses a total of 16 bytes which is the reason why there are eight entries in each directory sector (16x8=128 bytes) and therefore why there is a maximum of 64 files on a disk. (8x8=64 entries). This lines up perfectly with the above calculations involved with integrity checking.

In each directory sector, the address of each file name entry (the first byte) is BYTE 0, 16, 32, 48, 64, 80, 96 and 112. The first byte of each file name entry (the address byte) stores the files status, that is whether the file is currently locked, unlocked, deleted, open or unused. There are two status values for locked and unlocked files to indicate whether or not a file uses sectors outside the range of the single density format or those that use "enhanced sectors". This is used by DOS to enable it print the triangular brackets around "enhanced sector" files to show which are not accessible to the single density DOS 2.0s. The value stored in the status byte together with their meanings are

0	Unused entry
3	Unlocked file
35	Locked file
66	Unlocked file (not accessible to DOS 2.0)
67	Open file
98	Locked file (not accessible to DOS 2.0)
128	Deleted file

The first two of the next four bytes following the status byte of each directory entry is used to store the number of sectors that a file consists of and the next two bytes store the address of the file's first data sector, both are stored using the usual Atari two-byte format, thus

```
SECTORS=BYTE2+256*BYTE1
ADDRESS=BYTE4+256*BYTE3
```

Note that the variable ADDRESS contains the address of the first data sector of a file as stated in "sector linking" above.

The remaining eleven bytes of each file name entry is the actual file name itself, that is the first eight being the main file name and the last three being the file name extension. Whenever a file name comprises of less than the maximum eleven characters, the unused bytes are loaded with spaces (ASCII 32), where the characters used for the file name occupy the first available bytes. Note that the file name extension always occupies the last three bytes, even when space is available within the main file name area and that the extension is padded out with spaces in the same way as the main file name when necessary.

THE VTOC SECTOR 360

The VTOC sector 360 is a special sector used by DOS in which it keeps a record of all the currently used sectors on the disk. It does this by using all the bits of 90 of the bytes in this sector in a special way. All the bits of bytes 10 to 99 are used individually, as if to make up one 720-bit binary word (90 bytes x 8 bits = 720 bits). Since a single bit can contain either a "0" or a "1" and with 720 individual bits in the VTOC table representing the 720 sectors on the disk, the way the VTOC table is used becomes clear. All usable sectors are initially indicated in the VTOC table as "free for use" by setting the appropriate bits to "1", this is done automatically when the disk is first formatted. Whenever any sector on the disk is written to, the appropriate bit in the VTOC table is reset to "0" so as to record the sector as currently "in use" and in this way DOS calculates which sectors can be written to without overwriting a previously saved file. Using a "1" to represent a free sector and a "0" to represent a used sector is known as negative logic, since in many ways, it would have made more sense to let a "0" represent a free sector and a "1" to represent a used one.

The 90 bytes, that is bytes 10 to 99 in the VTOC table have their respective bits allocated thus - the highest order bit of byte 10 represents sector zero (sector zero cannot be used), the second highest order bit representing sector 1 and so on right up until the lowest order bit of byte 99 represents sector 719 (720 bits on a scale of 0 to 719).

Of the 720 sectors of a single density disk, there are some that can never be used for storing data and they are always marked in the VTOC table as used sectors. These sectors are the eight directory sectors (361 to 368), the VTOC sector itself (360) and the three boot sectors (1 to 3) making a total of 12 unusable sectors. Because of the hardware constraints, sector zero can never be used which now makes a total of 13 unusable sectors. Subtract this from the maximum number of sectors available, 720-13=707 and you have the reason why there are 707 sectors available on a single density disk.

The VTOC table is also responsible for keeping a record of the total number of usable sectors on the disk, which is 707 for a single density disk and 1010 for an enhanced density disk. This number is calculated using the normal Atari two byte format as follows ....

```
SECTORS=BYTE2+256*BYTE1
```

The total number of free sectors available for use is also stored here and again it is stored in the usual Atari two byte format, thus

```
FREESECTORS=BYTE4+256*BYTE3
```

All other bytes in the VTOC table are unused, these are bytes 4 to 9 and bytes 100 to 127.

THE SECOND VTOC SECTOR 1024

When a disk is formatted in enhanced density, a second VTOC sector is needed in which to record the status of the extra sectors and sector 1024 has been allocated for this purpose. Much of this sector duplicates a great deal of VTOC sector 360 and the bits of bytes 0 to 121 are used in exactly the same way as previously described. The highest order bit of byte 0 in this VTOC sector represents sector 49, the second highest represents sector 50 and so on up until the lowest order bit of byte 121 represents sector 1023. In this VTOC sector, there is no record for sectors 0 to 48

which are catered for in VTOC sector 360, sectors 49 to 719 are duplicated in both and sectors 720 up to the maximum of 1023 is catered for only in this VTOC sector.

Because of the duplication involved together with the fact that there is no record for the first 48 sectors in this VTOC sector and also that there are 16 sectors on the disk that cannot be accessed by DOS shows that the enhanced density format of DOS 2.5 and the 1050 disk drive was simply "added on" to the original single density DOS 2.0s.

In the enhanced density format, there are 1010 sectors available for use, which is the result of subtracting the number of unusable sectors from the maximum number on the disk which DOS can access, thus 1023-13=1010.

This VTOC sector 1024 also stores a number of free sectors, but in this case the maximum number stored is 303, these sectors are in addition to those stored in VTOC sector 360, therefore 707+303=1010 free sectors.

It is important to note that VTOC sector 360 remains the same regardless of the disk format density, except for the maximum number of sectors on the disk. In the case of a disk formatted in enhanced density, the number of free sectors reads 1010.

When writing a file to a disk formatted an enhanced density, the number of free sectors in VTOC sector 360 is reduced accordingly, just as if the disk was formatted in single density. Only when the number of free sectors available in VTOC sector 360 is reduced to zero, are sectors in VTOC sector 1024 used. One way of visualising this is to imagine two glasses of water where one glass must be completely emptied before the second glass is begun.

The number of free sectors in this VTOC sector are again stored in the usual two byte format using bytes 122 and 123 in the usual way, thus

```
FREESECTORS=BYTE123+256*BYTE122
```

The remaining four bytes in this VTOC sector are unused, they are bytes 124 to 127.

WHAT'S IT ALL FOR?

Well, the more you understand about how your disk drive works, the better equipped you will be when something goes wrong. Dig out a sector editor and examine some of your disks and you will get a better understanding of some of the points mentioned in this article. Better stick to a DOS 2.5 formatted disk at first though as there are many other unique formats that could well confuse you!

If you have some disks which have become scrambled you might be able to change appropriate sectors to recover some data. You might be able to work out how to increase the storage capacity of your disks (do you really need eight directory sectors?). You may even end up writing a super new disk editing utility. If you do, send it in for us all to enjoy!

Next issue John Foskett presents a super disk utility that uses much of the information discussed in this article

The CLINIC

TURBO ARRAYS

In this first column of programming hints David Sargeant explains a memory saving method of using arrays in Turbo Basic

I was working on a program in Turbo Basic where I have to store numeric data for each day of the year, so I set up a two-dimensional array with DIM ARRAY(365,2). At first, I could not understand why this was taking up so much memory but I then realised that, although the values were integers which could be stored in one or two bytes, each value was actually stored as a 6-byte Binary Coded Decimal. I was, in effect, wasting about two thirds of the space.

In C it is possible to use several different types of array depending on the sort of data you want to store and the one which is of interest in this case is referred to as an 'Integer Array'. Each element in the array can be either one or two bytes which means that integers between 0 - 255 or 0 - 65535 can be stored.

Applying this concept in Turbo Basic is not as straightforward as it is in C. In some ways C is more akin to machine language than it is to Basic as it regards memory from a much lower level. An area of contiguous memory needs to be reserved with a pointer ranging from zero to one less than the maximum size of the area to access any value. In Turbo Basic memory can be reserved by dimensioning a string variable and, although this is not the correct use for such a variable, it does not really matter what is stored here as long as it is not printed.

Hopefully, this simple program will help to demonstrate a one-dimensional integer array. For a two-dimensional array just set up as many strings as are needed.

```
10 DIM ARRAY$(6):ADDR=ADR(ARRAY$)
20 CLS: ? "Integer Array :";
30 FOR P=%0 TO 5
40    NUM=RAND(256)
50    POKE ADDR+P,NUM
60    ? NUM;" ";
70 NEXT P
80 ? :? " to exit":? :P=%0
90 REPEAT
100    ? "Pointer :";P;" points to ";PEEK
       (ADDR+P)
110    GET KEY: P=P+((KEY=42)&(P<5))-
       ((KEY=43) &(P>%0))
120 UNTIL KEY=27:END
```

Line 10: Dimensions an integer array for 6 values and finds the address of the array

Line 20: Clears the screen and prints text

Lines 30 to 70: Loads the array with random integers between 0 and 255 and prints each value

Line 80: Prints text and resets the pointer to zero

Lines 90 to 120: A loop where the value of the pointer and the relevant value in the array are printed. The pointer is incremented or decremented depending on which cursor key is pressed. The loop ends when the Escape key is pressed

The only drawbacks of an integer array are that more forward planning and programming code are required but it will certainly save memory on a large array.

Have you got any programming tips or examples for solving problems that we can feature in the Programmer's Clinic? Maybe you have a programming problem that we can ask others to solve. Write to the usual address.

The CLASSIC PD ZONE

Now that we are back on Earth there is time to catch up with the latest offerings from the Pudoso. They have been busy releasing many new titles since last we were home. Let's take a look at some of them ...

THE MAKING OF A MASTERPIECE

BBK ARTIST is a graphics 7+ art package with 25 commands at your disposal. Control is via a joystick and all commands are available from a grid display on the main menu. Also displayed are the 8 brush types, 4 colours (from a palette of 256) and 13 patterns. Grab a joystick and you're away!

All of the standard commands are available including Draw, Line, Circle, Box, Fill and Rays. The speed with which these commands draw is quite slow when compared to some commercial packages, though not enough to annoy. Also available is a Rainbow mode similar in style to the one in AtariArtist. A selected colour is displayed in all 256 colours.

The magnify mode (NLarge) is excellent. The draw screen is divided into two sections with the bulk displaying the magnified section. At the top is an actual size view. You can scroll all over the screen and both displays move with you. Movement is quick and smooth. There are three mirror modes available from the main menu: Horizontal, Vertical and 4-way. Any one of eight brushes can be selected with the Brush command. The Texture and Setcolor commands take a short while to get used to but soon become second nature. By selecting Texture you can use your joystick to pick one of the 17 colours and patterns displayed in the pattern palette at bottom of the screen. Whilst on the draw screen you can use the TAB key to change the colour.

The pattern palette contains four solid colours, twelve patterns and one user-definable pattern which can be altered with the Define Texture command. To change a colour you use Setcolor. The four colour registers are displayed in large boxes above the pattern palette. After choosing one you move your joystick up or down to change the luminance, and left or right to change the hue. Press the button when you're ready and the colour is stored.

The Undo command is essential to any quality art package. Whether you're experimenting with designs or you've simply made a mistake, an Undo command must be there to ... undo! BBK's Undo is two-way, i.e. press the joystick button and your last action is undone. Press your button again and it returns.

To check your work from the main menu you use the View command. This allows you to flip back and forth from the menu to the draw screen. If you don't like what you see and wish to begin again, just select Erase. There is an alert box to avoid accidental erasure.

The text commands are where BBK Artist excels. They allow you to place text on the screen in any size, colour or font. You begin with the Text Parameters command which allows you to define the content (up to 20 characters), size and direction of the text. To plot your defined text on the screen you simply select the Text command, move the cursor to where you want your text to begin and press your joystick button. The text then appears on the screen. With BBK Artist you can also change the font. By selecting the Font command you can load any 9-sector font with a .FNT extender. Three are provided on the disk (ROMAN.FNT is useful).

These text commands give you the ability to mix all manner of text on the screen. Of course, the text can also be mixed with your artwork.

The final four commands are for saving to or loading from disk. The Save command will save your picture as a Koala file. It automatically gives it a .PIC extender. There are three modes for loading pictures: Koala, MicroPainter and MagniPrint. Seven pictures are included on the disk, including some rather funny cartoons.

The ability to load MicroPainter files is very handy, however a MicroPainter save option should have been included as well. To convert Koala files to MicroPainter I use Pixel Artist Deluxe which features an optional save mode.

Overall, BBK Artist is a terrific art package. It is easy-to-use and has almost every command needed for general use. The powerful text commands are particularly impressive. Of course, there are other features I would have liked to have seen in BBK such as a tablet/mouse mode, Cut'n'paste commands, screen dump facility, airbrush, Bend command, etc. However, what must be taken into consideration is that BBK Artist is not an expensive commercial art package. It is PD! This is easy to forget as it is so impressive.

Of all the PD art packages around, I use BBK Artist and Pixel Artist Deluxe (PAD) the most. PAD has the advantage of a tablet mode plus Bend and Airbrush commands. However, BBK fights back with three mirror modes and powerful text commands. It's difficult to pick one over the other but for me BBK gets the nod because of the text commands.

CLASSIC PD ZONE RATING: 93%

STONE AGE SPACE INVADERS

Fans of Broderbund Software will enjoy the next disk. The Arcade Machine was a game creator package released by Broderbund in the early 1980s. Although it was never widely available in the UK (Silica Shop imported it for £45) there remain a number of PD titles which were created with it. They are all basically the same, i.e. Space Invader-type shoot-em-ups. Most are downright awful with zero playability but there is the odd one worthy of its parent program. One such title is ***THE STONETIME PEOPLE***, an interesting variation on the usual Arcade Machine format.

The Stonetime People begins with you, a boulder-pushing caveman, at the bottom of the screen. Above you are a number of craggy ledges from which nasty boulder-pushing cavemen (must have been a popular occupation) drop rocks on you and large birds swoop looking for their next meal. You can kill the nasties above you with, what I presume to be, your sling (which fires rather like a gun!). Cracks in the ledges allow you to kill the cavemen before they push their boulders over the edge. Kill enough nasties and you advance one level whereby the gameplay becomes a little harder.

The graphics are quite good and give a similar appearance to Conan by Datasoft. The way the cavemen tumble from ledge to ledge is nicely done. Press "C" to change the background colour and "L" to change the luminance. Sound effects are limited to blasts and jingles.

The Stonetime People, like all other Arcade

by Stuart Murray

Machine creations, suffers from a degree of 'slow-down' when too many characters are on the screen at once. If you judge this game by first impressions you may well never load it again. Given a chance, it proves to be reasonable entertainment. True, it is very basic but this gives it an old-time Broderbund/Datasoft feel which has held my interest for longer than anticipated.

The Stonetime People is the best example I have seen of an Arcade Machine creation. It's one for fans of the golden era of Atari computing.

CLASSIC PD ZONE RATING: 60%

DEFLECT AND DESTROY

Moving on a gaming generation, we have ***LASERMAZE***, a demo version of the 1992 commercial release by KE-Soft.

Lasermaze is an action puzzle game in which you must deflect a laser beam around a maze in order to destroy a number of objects. To do this, you can use sections of the screen border, the maze walls and moveable blocks. Press your joystick button and the laser beam shoots out from the centre of the screen and bounces around until it hits something. Watch out that it doesn't hit you because you'll stop the beam and a shot will be wasted.

You begin Level 1 with 24 shots. As the levels increase so do the number of shots. Run out of shots and you lose a life. Run out of lives and the game is over. As you progress, power-ups become available which, when hit by the laser beam, will give you extra ammunition, lives and points. The puzzles included are intriguing and will keep you occupied for a short while.

As mentioned earlier, this is a demo version. It features only the first five levels. The completed version is available from the address on the intro screen and features fifty levels, music and a level editor. The display is a mixture between the usual blocky KE-Soft graphics and the shaded style of Zeppelin. Colour is limited but shading is used to good effect. The objects are quite detailed in design and the laser beam zooms smoothly around the screen.

Lasermaze is an enjoyable game of budget commercial quality. Obviously, this demo is limited by the lack of extras which are included in the completed version, however for the price of a PD disk it is well worth considering and will keep you occupied for an hour or so. It also gives you the opportunity to try before buying - a luxury which is sadly no longer possible for most Atari 8-bitters.

Another perplexing puzzler from the puzzle kings of KE-Soft!

CLASSIC PD ZONE RATING: 70%

SEE-YA!

Before you can say "Atari Corp. executives are cavemen in disguise" it's time to report to Air Atari8 Terminal at Europa Spaceport. Earth leave is over and another flight is about to depart for the Classic PD Zone. I have a strange feeling that this journey is going to be different !

The disks reviewed were
DISK 241 - BBK ARTIST
DISK 200 - THE STONETIME PEOPLE
DISK 243 - LASERMAZE

XL/XE PROGRAMMING

RANDOM NUMBERS

David Sargeant explains some techniques which could be useful in all sorts of programs

The way to generate random integers in Turbo BASIC is to use the RAND function. **LISTING 1** demonstrates this by generating 150 numbers in the range 1-10, accumulating the occurrence of each number in a numeric array and then printing a simple frequency chart using the totals in the array. Notice the occurrence of every number is not equal, some numbers are generated more times than others. Given that there should be an equal chance of generating any number, it would seem to me that all the numbers should be produced an equal number of times.

So are these numbers really random? In the true sense of the word, they are not. The numbers are generated from the computer's internal clock and, since this pulses at regular intervals, numbers produced by these means can arguably be predicted and therefore can never be called 'random'. A more appropriate term would probably be 'pseudo-random' and this means the RAND function (and also the RND function for that matter) is reliable only for using once and not for creating a sequence of numbers.

The method I have come across recently for generating a sequence of pseudo-random numbers is one based on prime numbers, the algorithm for this is:

1. Set up the routine by choosing a prime number and a starting seed. The prime number must be greater than the highest number required in the sequence and the starting seed can be any number within range, or it can be generated from the internal clock by using the RAND function. Here I want to generate numbers in the range 1-10, so I use 11 for my prime number and 1 for my starting seed. The reason for using this particular prime number is it has a special attribute which all prime numbers do not share, it generates every number in the range 1-(1 less than the prime number)

2. Begin a loop which is terminated when the starting seed and the number generated are equal. Note that the condition (START=SEED) is true at the outset, but the value of SEED is altered within the REPEAT .. UNTIL loop. So, after the first iteration of the loop, this condition is now false and the

```
UA 10 REM ******************************
NC 11 REM *                            *
PA 12 REM * RANDOM NUMBER: LISTING 1 *
NG 13 REM *                            *
OP 14 REM *    BY DAVID SARGEANT       *
MK 15 REM *                            *
UM 16 REM ******************************
HY 100 DIM ARRAY(10)
HB 110 FOR I=%1 TO 150
RG 120 A=RAND(10)+%1
AM 130 ARRAY(A)=ARRAY(A)+%1
FZ 140 NEXT I
SD 150 GRAPHICS %0:? "NUMBER","FREQUENCY"
   :?
UK 160 FOR I=%1 TO 10
JR 170 ? "  ";I,;
RN 180 FOR J=%1 TO ARRAY(I):? "*";:NEXT J
   :?
GJ 190 NEXT I
```

Listing 1

```
UA 10 REM ******************************
NC 11 REM *                            *
QH 12 REM * RANDOM NUMBER: LISTING 2 *
NG 13 REM *                            *
OP 14 REM *    BY DAVID SARGEANT       *
MK 15 REM *                            *
UM 16 REM ******************************
YY 100 PRIME=11:START=%1
CG 110 SEED=START:SKIP=7
PM 120 REPEAT
IG 130 FOR I=1 TO SKIP
YO 140 SEED=SEED*%2
RM 150 SEED=SEED MOD PRIME
NE 160 NEXT I:? SEED
LL 170 UNTIL SEED=START
```

Listing 2

loop continues until all the numbers have been generated

LISTING 2 is the coding required for the above algorithm. I have added an extra piece of coding around the variable SKIP which ensures that only the 7th pseudo-random number is chosen on each iteration of the loop. All 10 numbers are still generated, but in a different, more varied, order. The value for SKIP must also be a prime number, although it need not be a special one.

If I wanted to generate the starting seed from the computer's internal clock, I would replace START=%1 with START=RAND(10)+%1. To simulate dice throws where numbers would have to be in the range 1-6, I would alter line 160 to IF SEED<=6 THEN ?SEED.

LISTING 3 *(overleaf)* is a small program to verify whether or not a prime number given by the user has the special attribute mentioned above. Note even though 1 and 2 are prime numbers they cannot be used in this program as they would give the wrong results - the input routine will not accept them.

SIMULATIONS

Pseudo-random numbers can be used to simulate events, although a lot of preparatory work has to be done as well. For instance, using these numbers alone to determine the scores for a football match would imply that a team would have as much chance of scoring 6 goals as it would have of scoring 1 goal. This does not happen in reality and so results have to be weighted to ensure there is more chance of choosing certain numbers. This is achieved by taking a sample of actual results and incorporating these into the system used for generating pseudo-random numbers.

For example, last season in the Carling Premiership there were 462 matches (22 teams, 11 matches per round, 42 rounds). The 924 team scores were tallied to produce the table below showing that 0 goals were scored by 268 teams, 1 goal was scored by 341 teams, etc. These results are then stored in a numeric array where elements 1-268 are set to 0, elements 269-609 are set to 1, etc. as shown in the table alongside.

There also has to be a method of accessing this Goals Scored table. The one I have devised, although there may be others, is to use another similarly sized numeric array to hold


```
UA 10 REM ******************************
NC 11 REM *                            *
RO 12 REM * RANDOM NUMBER: LISTING 3 *
NG 13 REM *                            *
OP 14 REM *    BY DAVID SARGEANT       *
MK 15 REM *                            *
UM 16 REM ******************************
JC 100 --
CT 110 EXEC INIT
GG 120 WHILE PRIME
CC 130 EXEC CHECK
CJ 140 IF PRIME_OK:EXEC GENERATE:ELSE :?
   "   Not prime":ENDIF
RM 150 EXEC GET_NUM
PR 160 WEND :END
JQ 170 --
JS 180 --
GU 190 PROC INIT
SK 200 GRAPHICS %0:? "          PRIME NUMBE
   R VERIFIER":? :?
FI 210 START=%1:SKIP=7:EXEC GET_NUM
VO 220 ENDPROC
JJ 230 --
JL 240 --
UY 250 PROC GET_NUM
PV 260 REPEAT
YR 270 INPUT "Enter prime number (0 to ex
   it) )",PRIME
KI 280 UNTIL (PRIME=%0)!(PRIME)%2)
WC 290 ENDPROC
JE 300 --
JG 310 --
FN 320 PROC CHECK
QF 330 NUMBER=PRIME:DIVISOR=%2
UT 340 WHILE DIVISOR<=NUMBER
UB 350 WHILE NOT (NUMBER MOD DIVISOR)
CC 360 NUMBER=NUMBER DIV DIVISOR
NG 370 WEND
FK 380 DIVISOR=DIVISOR+%1
NK 390 WEND
QK 400 IF DIVISOR=PRIME+%1:PRIME_OK=%1:EL
   SE :PRIME_OK=%0:ENDIF
VO 410 ENDPROC
JJ 420 --
JL 430 --
TF 440 PROC GENERATE
UP 450 SEED=START:COUNT=%0
PX 460 REPEAT
IR 470 FOR I=1 TO SKIP
YZ 480 SEED=SEED*%2
RX 490 SEED=SEED MOD PRIME
EA 500 NEXT I:COUNT=COUNT+%1
LD 510 UNTIL SEED=START
GI 520 ? "  ";COUNT;" numbers generated"
UT 530 ENDPROC
JO 540 --
```

Listing 3

No. of Goals	No. of Teams	Table
0	268	1-268
1	341	269-609
2	190	610-799
3	79	800-878
4	30	879-908
5	14	909-922
6	1	923-923
7	1	924-924

```
UA 10 REM ****************************
NC 11 REM *                          *
SV 12 REM * RANDOM NUMBER: LISTING 4 *
NG 13 REM *                          *
OP 14 REM *    BY DAVID SARGEANT     *
NK 15 REM *                          *
UM 16 REM ****************************
JC 100 --
CT 110 EXEC INIT:EXEC DISPLAY:END
JG 129 --
JI 130 --
GK 140 PROC INIT
UD 150 GRAPHICS %0:? :? "          FOOTBA
   LL RESULTS ":? :? :?
ZD 160 ? "Initialising...please wait":?
JQ 170 --
RF 180 # SET_TEAMS
XH 190 DIM TEMP$(22),TEAM$(242):P=%1
YM 200 TEAM$(%1)=" ":TEAM$(242)=" ":TEAM$
   (%2)=TEAM$
EC 210 RESTORE #TEAM_DATA
VI 220 FOR I=%1 TO 11
TY 230 READ TEMP$
PB 240 TEAM$(P,P+21)=TEMP$
NG 250 P=P+22
GE 260 NEXT I
JR 270 --
PU 280 # SET_GOALS
GW 290 DIM GOAL_TABLE(924)
YQ 300 RESTORE #LIMITS_DATA
JI 310 READ LIMIT:NUM_GOALS=%0
NH 320 FOR I=%1 TO 924
KR 330 IF I>LIMIT THEN NUM_GOALS=NUM_GOAL
   S+%1:READ LIMIT
JY 340 GOAL_TABLE(I)=NUM_GOALS
GD 350 NEXT I
JQ 360 --
QU 370 # SET_INDEX
US 380 DIM INDEX(924)
TC 390 START=RAND(924)+%1:SEED=START
BX 400 PRIME=1019:SKIP=7:P=%1
PM 410 REPEAT
IH 420 FOR I=1 TO SKIP
YP 430 SEED=SEED*%2
RN 440 SEED=SEED MOD PRIME
GE 450 NEXT I
TX 460 IF SEED<=924 THEN INDEX(P)=SEED:P=
   P+%1
LO 470 UNTIL SEED=START
MC 480 ENDPROC
JX 490 --
JG 500 --
IC 510 PROC DISPLAY
PY 520 # DISPLAY_TEAMS
DD 530 P=%1:FOR I=%1 TO 11:? "  ";
ZK 540 ? TEAM$(P,P+10);"     ";
VQ 550 ? TEAM$(P+11,P+21)
LT 560 P=P+22:NEXT I
JU 570 --
OJ 580 # DISPLAY_GOALS
FD 590 COL=16:P=%1
YL 600 FOR ROW=7 TO 17
IK 610 POSITION COL,ROW:? GOAL_TABLE(INDE
   X(P));
MG 620 POSITION COL+18,ROW:? GOAL_TABLE(I
   NDEX(P+%1));:P=P+%2
FD 630 NEXT ROW
VW 640 ENDPROC
JR 650 --
JT 660 --
BR 670 # TEAM_DATA
VI 680 DATA ARSENAL    ASTON VILLA
GR 690 DATA BLACKBURN  CHELSEA
SS 700 DATA COVENTRY   EVERTON
ZE 710 DATA IPSWICH    LEEDS UTD
TY 720 DATA LIVERPOOL  MAN CITY
UH 730 DATA MAN UTD    NEWCASTLE
SS 746 DATA NORWICH    OLDHAM
JG 750 DATA QPR        SHEFF UTD
QL 760 DATA SHEFF WED  SOUTHAMPTON
EV 779 DATA SWINDON    TOTTENHAM
OT 780 DATA WEST HAM   WIMBLEDON
KA 790 --
BT 800 # LIMITS_DATA
SG 810 DATA 268,609,799,878,908,922,923,9
   24
JN 820 --
```


pseudo-randomly generated indexes in the range 1-924. The index array can then be accessed in whichever way is suitable, but the index itself will always be random.

As you can see from the program coding of listing 4 the initialisation section is quite lengthy and it takes a while to execute With all the hard work done though, the display routine, in contrast, is relatively straight-forward and is just a matter of printing team names from the team string and the number of goals scored from the Goal table.

Well that is the end of RANDOM NUMBERS, but it need not be, you can take this matter a stage further on your own if you want to know more. The logical progression would be to consider whether the data used to construct the sample is typical. Complex methods can be used to predict the probability of discrepancies in your data and a sample which reflects these will give even more realistic results. Any good book on Statistics will provide the details. Anyway, I hope I have provoked a few thoughts and maybe it will encourage some of you other programmers to include this sort of technique in your own games or simulations.

VARIABLES USED IN LISTING 4

TEMP$	Temporary string for reading team names
TEAM$	String holding team names
I	Loop counter
P	String and array pointer
GOAL_TABLE	Goals scored array
LIMIT	Goal limit used to create goal array
NUM_GOALS	Current number of goals scored
INDEX	Array holding indexes for accessing goal array
START	Starting seed for number generation
SEED	Current number generated
PRIME	Prime number
SKIP	Varies random number generated
COL **ROW**	Cursor positions

THE NATIONAL LOTTERY

With Lottery obsession gripping the nation at present how about one of our 'wizard programmer' readers coming up with a super Lottery number selector using, perhaps, the random number selecting routines in David Sargeant's article?

We have already received a couple of programs of this nature but they are quite simple and could do with a few bells and whistles. Apart from the quality presentation that the Atari Classic is capable of, how about including features such as the ability to enter previous draws to select 'hot' numbers, or the ability to 'perm' a series of numbers to give better chances of winning on multiple entries? What about the ability to use names and birthdays as lucky numbers? If you are a real wizard programmer you could even having a lottery machine producing the balls similar to the many fruit machine simulators that have been programmed over the years.

There you have a good challenge, the results of which will be enjoyed by the majority of readers. We will publish the best programs submitted and if the Editor wins the jackpot then he guarantees that a couple of grand will be on its way to the lucky programmer!

Hints & Tips

SSSHH!

Paul Hollins shows you how to QUIETEN DOWN YOUR NOISY 1050

The Atari 1050 is the most widely used disk drive on 8-bit systems. The drives are reasonably fast, store quite a lot of data, but they do suffer from one major drawback ... they are incredibly noisy!

The time that this becomes the most apparent is when everyone is upstairs in bed, and there you are still hacking away at the keyboard on your latest masterpiece and it's time, once again, to do the dastardly deed and SAVE your work to disk. You carefully type SAVE "D:filename.ext" and gently press RETURN. CLUNK! WHIRR! BEEP! Congratulations you've just succeeded in waking the entire household.

What can you do about it? Well, you could buy an expensive air-tight, sound-proofed case to put your drive in, however it's not exactly practical is it? Okay then, you could try and get an internal modification kit to quieten it down, but they are expensive and very hard to get hold of. So what now?

Fortunately there is an answer, and the good news is that you do not need any knowledge of electronics whatsoever because no soldering is required and, here's the best bit, it's absolutely free!

All you will need is a small Philips type screw-driver, a couple of cotton-wool buds (the type you use to clean your ears with), a jar of Vaseline and a relatively dust-free environment to work in.

GETTING STARTED

Remove any disks and unplug all the cables from the disk drive, including the I/O cable. Turn the drive upside down and remove the six small screws holding the upper case to the lower case. Without separating the case turn the drive back up the right way. Remove the top case by lifting upwards from the rear of the disk drive. The black plastic front-panel can now be removed as well.

Without touching anything, study the inside of the disk drive and look for two small bars with a sliding 'thingy' in the middle of them. This 'thingy' is in fact the READ/WRITE head and now that you have got close to one of the main operating parts of the drive, obviously extreme caution is needed.

APPLY THE GREASE!

Using a cotton-wool bud, apply a little Vaseline onto each of the two bars being very careful not to use too much or get any on the READ/WRITE head itself. Once you've done that gently move the READ/WRITE head and put some Vaseline underneath where this was first sitting, once again being very careful. By the way, you may think that the more Vaseline you use, the quieter the drive will be, and to a certain extent, you'd be right. However by doing that, you also run the risk of getting it onto the READ/WRITE head, and I always find that if you do use too much, you can't hear a reassuring purr from your drive. You then start wondering whether it's functioning correctly or not!

ALL DONE

That is all there is to it. You now have a much quieter 1050. It's now time to re-assemble the drive. Refit the black plastic front plate and top cover, securing the six screws removed from the lower case. Finally, re-connect the drive to your computer and power supply.

Overall the process is quite simple and I can't see you having any problems with it whatsoever, but I must remind you that if you do attempt it you will invalidate any warranty you may have on your disk drive. Also I cannot be held responsible for any damage caused whilst you are attempting to do this minor surgery, or resulting from what I have suggested in this article. You will find that you have to repeat the process from time to time, when your drive starts to get noisy again. I usually find that I have to do this every 6 to 12 months, depending on usage.

Incidentally, some people prefer to use sewing-machine oil or 3-in-1 oil instead of Vaseline. It's just a matter of preference, as all of them have the same effect in the end but Vaseline is less likely to get into the innards of your drive if you use too much. •

Bits & Pieces

DISKFILE SOLUTION

Issue 71's disk contained a couple of bonus programs which were not mentioned in the magazine (a good reason for buying the disk if you are not a disk subscriber!), one of which was DISKFILE. Users will recall that I could not get the program to work from the issue disk but ***Leslie Benson*** has come up with the answer.

Diskfile works perfectly but only with enhanced density disks. It stores the descriptions on sectors 1025 onwards as these are not accessible to Atari DOS. The issue disk is always in single density to ensure maximum compatibility which is why it would not work straight from the disk. Diskfile is a great program that allows you to have an extended directory on your disk with descriptions of your files, try it.

If you only have a single density drive, you could try Super Directory from PD disk #25 - UTILITIES 4 which performs a similar function but stores the descriptions in a file.

XL/XE UTILITY

MULTI FORMAT

Take the easy way with formatting with M. Tomlin's easy to use formatter that will let you format disks as you wish

I know what you are going to say - not another formatter program! - but I think this will turn out to be your favourite. This small program will format a new batch of disks for you, write DOS and lock the file in either single or enhanced 1050 density. It uses the XIO command which is not documented very well in all the books I have read on Atari BASIC. The little trick I have used to write the DOS.SYS file work's well, but it will not write the DUP.SYS file. If you need DUP.SYS on your disks you will have to use the normal DOS menu option H.

```
UA 10 REM ******************************
IA 20 REM *     MULTI FORMATER          *
ZU 30 REM *           by                *
HB 40 REM *   M. TOMLIN W.A.C.O         *
JI 50 REM *          for                *
OQ 60 REM *  PAGE 6 NEW ATARI USER      *
WF 70 REM *       April 1995            *
UH 80 REM ******************************
BG 90 REM
ML 100 GOSUB 380:GOSUB 340
RH 110 GRAPHICS 17:? #6:? #6;"    multi format":? #6:? #6;"          BY":? #6:? #6;" M. tomlin W.a.c.o."
OT 120 ? #6;" -------------------":? #6:? #6
WM 130 ? #6:? #6;" 1 SINGLE     FORMAT"
FK 140 ? #6:? #6;" 2 ENCHANCED FORMAT"
QP 150 ? #6:? #6;" 3 S/FORMAT + DOS"
HC 160 ? #6:? #6;" 4 E/FORMAT + DOS"
BG 170 ? #6:? #6:? #6;"     SELECT WHICH":TRAP 440
GO 180 IF PEEK(764)=255 THEN 180
NT 190 GRAPHICS 0:SETCOLOR 2,0,0:POKE 752,1:POSITION 10,10:? "WORKING PLEASE WAIT"
VR 200 IF PEEK(764)=31 THEN GOSUB SDF
DU 210 IF PEEK(764)=30 THEN GOSUB EDF
MI 220 IF PEEK(764)=26 THEN GOSUB SDFD
TS 230 IF PEEK(764)=24 THEN GOSUB EDFD
FJ 240 GRAPHICS 0:SETCOLOR 2,0,0:POKE 752,1
UN 250 POSITION 5,6:? "  THIS DISC DONE PLEASE REMOVE":FOR W=1 TO 1000:NEXT W:POKE 764,255:GOTO 110
FO 260 REM SINGLE FORMAT
XP 270 XIO 253,#1,0,0,"D1:":RETURN
RA 280 REM ENCHANCED FORMAT
YS 290 XIO 254,#2,0,0,"D1:":RETURN
HF 300 REM S/FORMAT + DOS
UA 310 XIO 253,#1,0,0,"D1:":CLOSE #1:OPEN #1,8,0,"D1:DOS.SYS":CLOSE #1:XIO 35,#7,0,0,"D1:DOS.SYS":RETURN
CN 320 REM E/FORMAT + DOS
LP 330 XIO 254,#2,0,0,"D1:":OPEN #1,8,0,"D1:DOS.SYS":CLOSE #1:XIO 35,#7,0,0,"D1:DOS.SYS":RETURN
FO 340 GRAPHICS 0:SDF=270:EDF=290:SDFD=310:EDFD=330:POKE 764,255
CB 350 REM Verify off (80) back on (87)
UC 360 POKE 1913,80:RETURN
F5 380 GRAPHICS 0:SETCOLOR 2,0,0:POKE 752,1
GZ 390 POSITION 10,10:? "REMOVE PROGRAM DISC"
OR 400 POSITION 14,12:? "PRESS START"
FI 410 FOR W=1 TO 150:NEXT W:POKE 559,0:FOR W=1 TO 150:NEXT W:POKE 559,34
DD 420 IF PEEK(53279)<>6 THEN 390
ZG 430 RETURN
SE 440 GRAPHICS 0:POKE 752,1:SETCOLOR 2,0,0:POSITION 7,10:? "CHECK DRIVE SELECT 1 TO 4":FOR W=1 TO 900:NEXT W:RUN
```

HOW TO GET DOS?

It's a shame the program won't write DUP-.SYS but perhaps somebody can improve it to do so, how's that for a challenge for someone? There are plenty of REM's in the program so you can follow what is going on very easily. It should only take a hour to type in or get this issue's disk where it will be ready to run. The program is menu driven, with onscreen warnings to remove your program disk. Because of the destructive nature of the program, make sure you follow the onscreen prompts.

The program runs on the 800XL and 130XE but I cannot say if it will work on the older 8-bit Atari's as I have never had one and I believe due to the different operating system, it probably won't.

I send greetings to all Atari users around the world. Have Fun!

TUTORIAL TIME

by Ian Finlayson

BACK TO BASICS

My article is not a tutorial this time - to be frank I ran out of ideas! So if there is a Basic programming subject that you would like addressed in some detail please write and let me know.

VISUAL BASIC

I have been working in some depth with Microsoft Visual Basic on my PC over the past few months, and that is what prompted this article. Visual Basic (I will call it VB from now on) is becoming popular as a programming language for Windows for the same reason that the various Basics on much smaller computers, like the Atari, have been popular with home computer enthusiasts over the years. That is, the accessibility of the language.

VB is a Windows program and it is different in many ways from earlier versions of the BASIC language. First it needs a reasonably fast processor (mine is a 386DX40) and lots of memory (4 Megabytes is only just enough!). Compare Atari BASIC at 8K running on a 64K machine! Second it has a good range of ready-to-use controls, and takes advantage of the windows environment, so creating a man-machine interface is very quick. Screenfulls of forms with push button controls, check boxes, radio buttons, drop down lists, text boxes and graphic boxes can be created easily. Also the use of a mouse and its pointer is mostly handled automatically.

Once the screen layouts are complete there is still a need to write code to make things happen, and here again VB is different. The code is all event driven. This means that the program is created in small modules or subroutines and these are usually attached to an event. Each control has a set of events that can be used. For example if you use your mouse to point to a control and then click on the mouse button a click event is initiated and the code you have attached to that event will be executed. It is at this level that VB's parentage in older BASICs is revealed. Many of the program structures are recognisable.

BASIC ON THE ATARI

The original Atari BASIC was a bit different from other BASICs, particularly in its string handling, and it was also missing some of the common programming structures. However it has the advantage of being concise and some of its features such as graphics and sound were quite revolutionary. Although its range of structured programming commands was limited they could be used to build more complex constructions though the resultant code was not always very easy to read! It was, and indeed still is quite a good language to start to learn on.

Turbo BASIC for the Atari is much more recent. It is quite remarkable in that it is a little smaller than Atari BASIC, but it has all the original Atari BASIC commands and a whole lot more. It runs programs faster, and it has a compiler which allows programs to be compiled and to run yet faster by 3 to 5 times. This compiled code is rather like the code compiled by VB - neither produces true stand alone code. Compiled Turbo BASIC programs need the RUNTIME.COM module and VB programs need the VBRUN300.DLL runtime module to run. The extra structured programming commands in Turbo BASIC include DO .. LOOP, IF .. ELSE .. ENDIF, REPEAT .. UNTIL, WHILE .. WEND. They make it much easier to write highly readable tightly structured code and they can be recognised with slightly different syntax in VB. Turbo BASIC is available from the Page 6 Accessory Shop (Disk DS#6). If you don't have it you can't use it so order today - remember your old Atari BASIC programs will run faster with Turbo BASIC.

UTILITIES

BASIC for the Atari has been around for quite a number of years - indeed a very long time in computer terms! This means that many other people have already gained experience in the language. You can take advantage of their experience by analysing their programs, and you can also take some short cuts by using "toolkits" of useful subroutines and so on that others have developed. Page 6 have a few of these that you can look at at very little cost. Try the following:

#65	Atari Basic Power Pack
#186	Extended Atari Basic
DS#20	Turbo Support 1
DS#105	Turbo Basic Programmers Kit (3 disks)

GET STARTED

So, if you have never tried to write a program, now is a good time to start. Atari BASIC is OK, but I would recommend moving straight on to Turbo Basic. Programming is fun, and it certainly keeps the brain ticking over. Who knows, at some time in the future you might find this skill can be extended and turned to commercial use (with appropriate rewards!) •

BIG SCREEN

Ann O'Driscoll uses her own recent tutorials on display lists to show how you can extend the screen area for added effect

The short listing shown here is a simple demonstration of how the blank area above the normal screen display might be used in a program. If you look at a display list in any of the Graphics modes you will see that the first three instructions are 112, 112 and 112 - this tells Antic to show 8 blank scan lines three times, or 24 scan lines in all. This is equivalent to the height of three rows of Graphics 0 characters. The original purpose of the scan lines was to ensure that the screen display, set by the text or graphics instructions, would be fully visible: On older televisions the top rows tended to be cut off and the scan lines were used to push the picture down. This is not a problem with newer TV sets and monitors so we can now use this area ourselves.

The program shows how a game title and score could be put at the top of the screen. The "score" is increased each time the space-bar is pressed. Hitting any other key shows its ASCII code. The title and score are stored in a separate area of RAM and stay on the screen even when the main screen display scrolls off.

RESERVED SCREEN RAM AREA

The pointers to the start of screen RAM are at memory locations 88 (low byte) and 89 (high byte), so you find the starting address by

PEEK(88) + 256*PEEK(89)

On the conventional Graphics 0 screen, location 88 holds a 64 and location 89 holds 156, giving a screen RAM start of 64 + 256*156 = 40000. **LINES 120** to **140** of the program set up a protected screen RAM area for the new text lines and move conventional screen RAM

continued on page 48


```
UR 100 REM  DISPLAY LISTS AND SCREEN 
CU 101 REM  RAM: USING THE AREA ABOVE 
HA 102 REM  THE NORMAL SCREEN 
XO 103 REM  BY ANN O'DRISCOLL 
GB 104 REM  FOR NEW ATARI USER - JUN 95 
RE 106 REM
BV 110 CLR :GRAPHICS 0:DIM A$(3)
XH 119 REM  -- Reserve RAM  for the extra
   lines in the display
MZ 120 A=156
UC 125 POKE 106,A-1
KE 130 SCR=PEEK(88)+256*A:FOR N=0 TO 79:P
   OKE (SCR+N),0:NEXT N
LP 140 B=151
SC 149 REM  -- Change the display list 
FV 150 DL=PEEK(560)+256*PEEK(561)
EG 160 FOR N=0 TO 4:READ C:POKE 1536+N,C:
   NEXT N
AG 170 DATA 70,64,156,6,2
VI 180 FOR N=0 TO 27:POKE 1541+N,PEEK(DL+
   3+N):NEXT N:POKE 1568,0:POKE 1569,6:PO
   KE 1536+7,B
ZU 190 POKE 560,0:POKE 561,6
IF 199 REM  -- Print to new area 
SR 200 POKE 89,A
TI 210 POSITION 1,0:? "g a m e  t i t l e
   "
TB 220 POSITION 25,0:? "SCORE"
OV 229 REM  -- Reintroduce normal Ram 
TK 230 POKE 89,B
BA 250 ? :? :?
ET 260 ? "}┌───────────────────────────┐"
ES 265 ? "}│                           │"
EF 270 ? "}│                           │"
JI 275 ? "}│ PRESS  SPACE  TO CHANGE   │"
SM 280 ? "}│ THE SCORE AT THE TOP      │"
EW 285 ? "}│                           │"
LM 290 ? "}│    PRESS ESC TO QUIT      │"
EY 295 ? "}│                           │"
JB 300 ? "}│ PRESS ANY OTHER KEY TO    │"
JD 305 ? "}│ DISPLAY ITS ASCII CODE    │"
DU 310 ? "}│                           │"
EJ 315 ? "}│                           │"
AX 320 ? "}│ EVEN WHEN THE DISPLAY     │"
RP 325 ? "}│ SCROLLS OFF THIS SCREEN   │"
RI 330 ? "}│ THE SCORE AND TITLE       │"
WF 335 ? "}│ WILL STAY...              │"
FB 340 ? "}└───────────────────────────┘"
WY 400 CLOSE #1:OPEN #1,4,0,"K:"
KX 410 GET #1,KEY
RI 420 IF KEY=32 THEN 500
UA 430 IF KEY=27 THEN GRAPHICS 0:CLR :END
EF 440 ? KEY
NI 450 GOTO 410
DO 499 REM  -- POKE up new figure 
FZ 500 SC=SC+1:IF SC>999 THEN SC=0
OP 510 A$=STR$(SC)
HJ 520 FOR N=1 TO LEN(A$):S=ASC(A$(N,N))-
   32
SQ 530 POKE SCR+31+N,S:NEXT N
NU 540 GOTO 410
```

down to a lower memory location. **LINE 120** sets the high byte for the reserved screen RAM at page 156 (defined by the variable A). **LINE 125** moves the top of user memory, found by PEEK(106), down below this, to page 155. The high byte for the conventional screen memory is lowered as a result - this is now defined by the variable B in **LINE 140**. The contents of location 88 (screen RAM low byte) are not affected by the changes. The variable SCR in **LINE 130** shows where the protected screen RAM starts; the FOR NEXT loop clears the area which will be used by the program.

A NEW DISPLAY LIST

LINES 150 to **190** make a new display list and put it in Page 6 of memory, which starts at location 1536. The first 5 numbers in the revised list replace the 112, 112, 112 from the original Graphics 0 instruction set. LINE 170 holds the new instructions in a DATA statement:-

- **70** means Load Memory Scan (64) plus show a Graphics 1 line (6)
- **64** is the low byte address for the screen RAM for our extra lines (the number found in location 88)
- **156** is the high byte address for the new screen RAM, as defined in LINE 120 above
- **6** means show a Graphics 1 line
- **2** means show a Graphics 0 line

The rest of the new display list is basically the same as the remainder of the original one. The only changes are in the last two bytes, which now direct the computer to the new display list memory location at Page 6, and the 8th byte (1536+7) which puts the new high byte for the ordinary screen RAM into the relevant LMS address.

WRITING ON THE SCREEN

Text is printed directly to the new screen area in **LINES 210-220** using the standard POSITION and PRINT commands. In order to do this, the high byte for the reserved screen RAM is poked into memory location 89 (LINE 200). **LINE 230** reintroduces normal screen RAM, by POKEing the "conventional" high byte back in to location 89. The 24 line Graphics 0 screen is now operational again. **LINES 500** to **530** look after the score routine. **LINE 510** converts the score values to a string. **LINE 520** subtracts 32 from the ASCII value of each character in the string - this gives us the "internal code" for each number which may be POKEd directly to screen RAM. This is done in **LINE 530**: SCR is the protected RAM area's starting address as defined earlier. The plus 31 brings us a little over half way along the second line of Graphics 1 text, because this mode uses 20 bytes of RAM per line. **LINE 540** sends the program back to get another keypress once the score has been updated.

That's all there's to it. I hope the above account on what the program does has been clear, and that I have given enough information to enable you to adapt the routine for use in your own listings.

Have you got any programming gems like Big Screen? If so, let's see them so we can share them with others

ROM CARTRIDGES

All brand new in original boxes, mostly shrink wrapped

TENNIS

Forehands and backhands, driving approach shots, angled volleys, overhead smashes and tricky lobs - you've got all the strokes in Tennis! Here's the action packed game that challenges you to play at your best. Play singles against the computer or another player or doubles against another player.

CLOSEOUT PRICE £2.00 plus 70p p&p

MILLIPEDE

Creepy crawly bugs like jumping spiders, buzzing bees, bouncing beetles, mosquitoes, dragonflies, inch worms and earwigs have invaded your little garden patch and you have to blast fast to get rid of them! Fast action graphics and great sound. Use your Trak-Ball for even greater play power.

CLOSEOUT PRICE £2.00 plus 70p p&p

DEFENDER

An all-time classic from the arcades. Aliens have swarmed over your planet attempting to capture humanoids and transform them into destructive mutants. Fortunately you command Defender, the most deadly spaceship ever. Keep an eye on the radar for the next attack wave. 1 or 2 players.

CLOSEOUT PRICE £2.00 plus 70p p&p

GALAXIAN

Swarms of Drones, Emissaries and Hornets lead the way in attack and protect the Commanders who guide the force. Your only hope is to blast them out of the sky before they destroy you. True classic excitement that can still give you sweaty palms. 10 skill levels.

CLOSEOUT PRICE £2.00 plus 70p p&p

ONE ON ONE

Play basketball with two of America's top players in this great sports simulation which features realistic offensive and defensive moves, fatigue factors, hot streaks, a shot clock, even instant replay and a shattering backboard! Like the game of basketball itself, One-on-One rewards you for playing with your head as well as your hands. Master the joystick moves, sharpen your timing and hone your reflexes. Jump! Shoot! Score!

CLOSEOUT PRICE £2.00 plus 70p p&p

US FOOTBALL

American Football is a big craze in this country and you can now play at home. Outsmart the defence, pass with amazing accuracy, run with speed and agility, make tackles, select offensive and defensive plays and more. You can take on the computer in a practice game or challenge a friend to a dramatic video bowl game of your own in a packed stadium. All the thrills of the gridiron

CLOSEOUT PRICE £2.00 plus 70p p&p

KABOOM

The Mad Bomber is back and intent on blasting you to kingdom come unless you can get your buckets of water out catch and diffuse the bombs. One of the simplest concepts yet highly entertaining, especially for the kids.

CLOSEOUT PRICE £2.00 plus 70p p&p

SUPER BREAKOUT

Breakout was the original simple yet totally addictive game and this enhanced version will provide even more addictive fun. Needs paddles.

CLOSEOUT PRICE £1.00 plus 70p p&p

FIGHT NIGHT

Fight Night brings you all the thrills of the boxing ring as you face five of the most brutal fighters ever. Its five separate battles are total war with relentless action. The Boxing Constructor Set allows you and your opponent to create your own perfect boxers, selecting stamina, intellect and style. Train, spar and step into the ring to pit your boxer against the computer or another opponent.

CLOSEOUT PRICE £2.00 plus 70p p&p

POLE POSITION

Everyone has heard of Pole Position, the racing game that inspired almost every racing game since. It may be the original and some other games may have added features but Pole Position still retains its challenge after many years. One of those games that has exactly the right balance of game play and graphics to make it a classic that will last forever. If it is not in your collection, make amends now!

CLOSEOUT PRICE £1.50 plus 70p p&p

HARDBALL

All the thrills of American baseball can be yours on a summer afternoon in the ballpark. Sit behind home plate, along the left field line, down the right field line or join the manager in the dugout. Look over the pitcher's shoulder as he throws the next ball. You control all the action of the batsmen, pitchers and fielders as you try and battle your way to the top of the league. An exciting game for one or two players.

CLOSEOUT PRICE £2.00 plus 70p p&p

BASIC CARTRIDGE

Some programs, especially some early public domain programs won't run on the XL/XE but they will if you plug in the old version of Basic.

CLOSEOUT PRICE £1.00 plus 70p p&p

DESIGNERS PENCIL

A new programing language that is based around the creation of graphics screens. Difficult to explain but worth a go at this price!

CLOSEOUT PRICE £1.00 plus 70p p&p

DISKS ... DISKS ...

SILICON DREAMS

Taking the role of Kim Kimberley you are a leading participant in the colonisation of Eden, a planet prepared for human habitation by an advance guard of intelligent robots who battle with the native and highly aggressive fauna. In this highly structured and realistic environment you must move your mind into the twenty-third century. Silicon Dreams is three excellent graphics adventures - SNOWBALL, RETURN TO EDEN and THE WORM IN PARADISE from the masters, Level 9

CLOSEOUT PRICE £1.50 plus 70p p&p

ZORK 1

The Infocom classic and the adventure game that changed the way all future adventures were written. The Great Underground Empire of Zork is well documented by now and thousands of players have become addicts graduating to Infocom's more difficult adventures. Zork I is the ideal introductory level adventure for beginners or those with a little experience. If you have never ventured underground before now is the time to try, it's never been cheaper to expand your universe! Classic original Infocom packaging with excellent manual and a map.

CLOSEOUT PRICE £1.50 plus 80p p&p

MUSIC PAINTER

An exciting educational program that helps to teach music by using colours instead of notes. Change the fifteen supplied songs to feature different instruments, make the notes longer or shorter or transcribe your own songs. No musical knowledge required to make your own great music.

CLOSEOUT PRICE £1.00 plus 70p p&p

PANZER GRENADIERS

In this exciting solitaire wargame you make the decisions for a regiment of the elite armoured infantry attached to the Panzer Grenadiers. Your forces also include mortar, artillery, Panzer IV, Panther and Tiger units. The Russian enemy is directed by the computer which will fiercely challenge you with its own complement of infantry, tanks and anti-tank guns. Three levels of difficulty, joystick control, hi-res graphics.

CLOSEOUT PRICE £1.50 plus 70p p&p

THE E FACTOR

The E factor represents the amount of time the enrgy sources on the planets in our galaxy will last. Many planets need emergency fuel capsules delivered if they are to survive. You must plot the interplanetary course and guide your craft through the quadrants filled with obstacles such as space mines, alien fighters and spinning asteroids. Can you complete a mission before another planet calls on your services?

CLOSEOUT PRICE £1.00 plus 70p p&p

See last page for postage on more than one item

LANCELOT

Level 9 recreate the time of wizards and the Knights of the Round Table in a three part adventure spanning the complete saga of the quest for the Holy Grail. Superbly researched and superbly written this text adventure is full of atmosphere and highly recommended.

CLOSEOUT PRICE £1.50 plus 70p p&p

RAMPAGE

It's rough and tumble all the way as you control three, incredibly nasty characters which bear a remarkable resemblance to King Kong, Godzilla and Wolf-man through an orgy of destruction in Chicago, New York and San Francisco. You have 150 days of destruction in 50 different cities. Time for some revenge!

CLOSEOUT PRICE £1.00 plus 70p p&p

DRUID

Another classic in which, as Last of the Great Druids, you wander through the Dungeons of Acamantor with your mighty Golem by your side on a quest to destroy the four demon princes. As you delve deeper into the dungeons you will find chests containing spells of formidable power to aid you and Pentograms of Life which will heal and revitalise you. Excellent graphics and superb gameplay make this one of the best arcade games.

CLOSEOUT PRICE £1.00 plus 70p p&p

GAUNTLET THE DEEPER DUNGEONS

If you have the original Gauntlet disk then you will know how good the game is and will want to extend play with the Deeper Dungeons. Over 500 new dungeons are here for you to explore. This is the way to revive your interest in Gauntlet and play on for many more hours or days! This is a data disk only and requires the original Gauntlet disk.

CLOSEOUT PRICE £1.00 plus 70p p&p

NEW YORK CITY

Welcome to The Big Apple. This hurried jungle of steel, concrete and glass bristles with fascinating sights and more than its share of danger. From the placid greenery of Central Park, there is no city in the world like New York, and boy are you about to find that out! As a visiting tourist you only have a limited time to see all the sights, but New York City has a little more excitement, a little more danger than a sightseeing trip to the zoo!

CLOSEOUT PRICE £1.00 plus 70p p&p

BALLBLAZER

The year is 3097 and you are the contestant in the most competitive and by far the most popular sport in the universe. Jump immediately into head-to-head action against a friend or hone your skills against a selection of Droids. Either way, you're in for the match of the century! Excellent graphics and split screen action have made this one of the Atari classics.

CLOSEOUT PRICE £1.00 plus 70p p&p

DISKS ... DISKS ...

JUNO FIRST
A fast and furious space shoot 'em up translated from Konami's early arcade machine of the same name. Dozens of alien craft will attack from all sides and you must be quick to blast them away and earn your bonuses. If you feel that you are going to die then you can take the last resort and warp away through a kaleidoscope of colour. Similar to invaders, this fast shoot 'em up will appeal to any arcade game fanatic.

CLOSEOUT PRICE £1.00 plus 70p p&p

JUGGLES RAINBOW
A first computer experience for children aged 3 to 6 that teaches the concepts of above, below, left and right plus letter recognition allowing children to enjoy learning with colours and music and games they can create and play themselves

CLOSEOUT PRICE £1.00 plus 70p p&p

JUGGLES HOUSE
Another neat program for 3 to 6 year olds teachin g the concepts of inside, outside, upper and lower with Juggle's house and toyshop

CLOSEOUT PRICE £1.00 plus 70p p&p

THE LIVING DAYLIGHTS
Control James Bond through eight fast and furious levels from Gibraltar to Afghanistan and you will encounter the SAS (friendly), the KGB (not so friendly) and enemy helicopters (very unfriendly!). You are up against Brad Whittaker, international arms dealer and megalomaniac, Necros, his ruthless sidekick and Koshkov, the double dealing KGB General. You may fall in love with the beautiful Czech cellist Kara, but can you trust her?

CLOSEOUT PRICE £1.00 plus 70p p&p

NIBBLER
Slinking through an unknown land Nibbler finds himself in an iridescent world of constant change. As time grows short his body grows longer and he risks running into himself. Can he survive?

CLOSEOUT PRICE 50p plus 50p p&p

ROSEN'S BRIGADE
Join the whackiest fighting troup around as you do battle with all and sundry. Not a simulation, just a good, old-fashioned arcade game hung around a dodgy premise! Give it a go anyway, what more do you wnt for a quid!

CLOSEOUT PRICE £1.00 plus 70p p&p

MAXWELL'S DEMON
A simple yet challenging puzzle game which will get you totally addicted. In fact two games in one for double the fun

CLOSEOUT PRICE 50p plus 50p p&p

DRELBS ⑩
Can't remember what this one is about but it sounds like a good old beat the alien blobs game. We've only got a couple left anyway so be the last one on the block to buy a copy

CLOSEOUT PRICE £1.00 plus 70p p&p

TAIL OF BETA LYRAE ⑩
Our A-Z of Atari Software series said 'The ultimate Scramble clone with superb graphics and music'. A great horizontal scroller that set the standards for others to follow

CLOSEOUT PRICE £1.00 plus 70p p&p

CASSETTES

SILICON DREAMS
Taking the role of Kim Kimberley you are a leading participant in the colonisation of Eden, a planet prepared for human habitation by an advance guard of intelligent robots who battle with the native and highly aggressive fauna. In this highly structured and realistic environment you must move your mind into the twenty-third century. Silicon Dreams is three excellent graphics adventures - SNOWBALL, RETURN TO EDEN and THE WORM IN PARADISE from the masters, Level 9

CLOSEOUT PRICE £1.00 plus 90p p&p

COLOSSUS CHESS 4
Claims to be the best chess program of all. The writers of Sargon III would disagree, but there is no doubt this is a fine chess simulation particularly for advanced players

CLOSEOUT PRICE £1.00 plus 70p p&p

JUGGLE'S HOUSE
Another neat program for 3 to 6 year olds teachin g the concepts of inside, outside, upper and lower with Juggle's house and toyshop

CLOSEOUT PRICE £1.00 plus 70p p&p

INVITATION TO PROGRAMMING 2
A stand alone course in programming in Atari Basic (does not need part 1). Three cassettes and a comprehensive manual will teach you some of the first steps in Basic programming. Useful if you have just got an Atari or want to pass your machine onto someone else

CLOSEOUT PRICE £1.00 plus £1.20 p&p

BARGAIN CASSETTES

Your choice of
any 5 cassettes for £1.50 plus 80p p&p
any 10 cassettes for £2.00 plus £1.20 p&p

180
Eight opponents, digitised speech, two player option. live joystick control, full matchplay scoring, superb playability.

BOMB FUSION
A terrorist gang has planted bombs in the Nuclear Processing Plant and you have to go in to save the plant

CANNIBALS
See if you can make it through the jungle and avoid being eaten - the natives are not friendly!

DESPATCH RIDER
Join the growing band of street demons who terrify the population of the big cities to get the parcels through.

FEUD
You must "out-spell" your rival Wizard. Tread carefully as strange things can happen in this game of magic

FOOTBALL MANAGER
Everything you might want in a managerial simulation. Far too many features to describe, but you won't be disappointed

GHOSTBUSTERS
At this very moment hundreds of ghosts are making their way to the infamous spook central. Only you can save the world from disaster

GOLDEN BATON
A text adventure in the classic style in which you have to survive various perils as you discover the route to the location of the fabulous Golden Baton

GUN LAW
Four months of bloody alien attacks have taken their toll. You are left to fight alone against ruthless and bloodthirsty killers with just a single machine gun

HENRY'S HOUSE
Little Henry has shrunk and must navigate his way through the royal household to find the cure. Voted one of the all time great games

INVASION
Mobilize your units and prepare for battle. This all action space conflict requires skill, strategy and tactics.

KIKSTART
The ultimate off-road motorbike scramble. Guide your rider over the obstacles in this great game for 1 or 2 players

KNOCKOUT BOXING
Challenge for the Heavyweight Championship of the World by boxing your way past nine opponents

LOS ANGELES SWAT
Rescue the hostages from the terrorist gangs holding out in West L.A. Clean up the streets. Blow away the bad guys

MASTER CHESS
An excellent chess simulation with all the correct moves, various openings, in fact everything to keep you challenged

MILK RACE
Cycling 1,000 miles is no mean feat - and you could end up feeling pretty exhausted by the time you've finished playing this superb race simulation

MR DIG
An old favourite in which Mr Dig has to dig for hidden food supplies in the 'Meanie' territory below ground.

NINJA
Blasts the belt off all other martial arts games! It says on the inlay! Someone sure reckons this is the best punching, kicking, ducking and diving game of all

ON CUE
A challenging real life simulation which combines Pool and Snooker on the same cassette. An absolute must for both enthusiasts and beginners alike.

PANTHER
Save the last humans on Xenon. Take your ground attack ship through this 3D scrolling mega shoot-em-up with great graphics and unbelievable soundtrack

PENGON
Can you save Penguin Willy from the ferocious mutant sea lions? Stun them by knocking them against the walls or crush them with sliding ice blocks

PLASTRON
Take your place in a small band of pirates out to steal fossil fuels from the biggest corporation in the galaxy.

PROTECTOR
Assigned to the US Army Helicopter Training School your aim is to become the best chopper pilot in the West

ROGUE
Your task is to search the Dungeons of Doom for the Amulet of Yendor. You will encounter fearsome monsters and fiendish traps to challenge all your skills

REVENGE II
The Mutated 90 foot high, laser spitting death camels have rebelled against their captors the Zzyaxians and are out for revenge! A Jeff Minter classic

ROCKFORD
The only true arcade version of the classic game Boulderdash. Explore 4 levels on each of 5 different worlds

SIDEWINDER II
It is 27 years since the final battle of the war with the aliens. All this is about to change. Step aboard your craft to defend mankind in this space blast

SPEED HAWK
Defend the ring worlds of your solar system from space pirates. Another of the great space games

SPEED ZONE
Enter the Speedzone in a frantic defence against alien forces. A survey ship comes under attack and your "Starfire" class attack craft is launched

STAR RAIDERS
What more can be said. Probably the best computer game in the world - ever!

TAIL OF BETA LYRAE
Our A-Z of Atari Software series says "The ultimate 'Scramble' clone with superb graphics and music."

TWILIGHT WORLD
Enter the Twilight World. Equipped with the latest in anti-gravity pods and Laser weaponry, battle your way through each of the eleven dungeons

UNIVERSAL HERO
Only seven seconds left to save the planet! Universal Hero has to save his skin and everybody else's by finding bits to repair a shuttle

ATARI WORLD

No, not the shop that closed down a few years ago but a new mag for the ST!

The demise of the highly regarded ST Review magazine was a painful blow for disillusioned ST users - indeed, many thought it signalled the final doom of mainstream ST support. However, it's well known that Atari owners are a dedicated bunch (to say the least) and, in seemingly almost no time at all, ST Review's editor, Vic Lennard, is back in the driving seat of a new publication called Atari World. The publisher is Neil O'nions, who also happens to own the Atari supplier Compo Software Ltd., so it's no surprise that Compo adverts feature strongly through the mag.

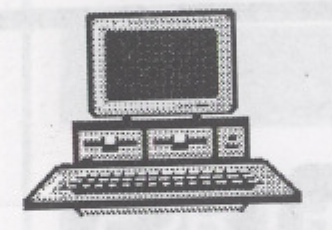
Atari World is subtitled 'The essential guide for all Atari Computer Users' but 8-bit readers shouldn't get too excited - I couldn't find more than a passing mention of the XL/XE, though Falcon and Jaguar owners do get a fair look in. The launch issue contains 84 pages together with two "free" pull out supplements of 16 pages each - ST Source and Atari Pro, covering beginners' topics and serious matters respectively. Unlike previous ST magazines there is no cover disk attached but a 'readers disk', containing programs related to articles in the magazine, can be purchased by mail order. This arrangement means that the cover price is pegged at a reasonably affordable level.

Atari World's news section is surprisingly large, which will come as a relief to those who thought that ST computing was only studied in history lessons. A CeBit show report reveals the typical absence of Atari Corporation, but there is encouraging mention of impressive ST emulation on Apple Macs, running MagicMac software. Elsewhere, the main features cover Papyrus 4.0 - an apparently heavyweight word processor from Germany - and music matters, including the present controversy over MIDI file licensing. A reviews section forms the core of editorial content. Here we find detailed coverage of The Quill 2, ScreenBlaster 2 (Falcon) and Video Supreme. DegasArt 3 and Positive Image also get a spin, whilst for gamers there is mention of forthcoming games, Team, Pinball Dreams (Falcon) and Cannon Fodder (Jaguar). The beginners' pages of ST Source cover the basics of boot disks, accessories and desktop enhancements. The Atari Pro section discusses the Falcon's display modes and direct-to-disk recording facilities. Desk Top Publishing is also subject to investigation.

Although the first issue isn't exactly overwhelmed with content, I'm pleased to report that Atari World is a good quality glossy with the 'sensible' house style of ST Review and a generally high standard of presentation. For those dismayed by the closure or scaling back of most other ST publications, Atari World is a very welcome development. I wish it well.

Atari World is published by Specialist Magazines Ltd. and distributed by SM Distribution. It's available from newsagents at a price of £2.50 or on quarterly subscription at £7.50.

reviewed by Paul Rixon



JOURNEY INTO CYBERSPACE

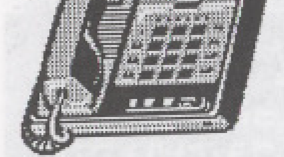
John S Davison tackles the Internet in an ultimate quest for the fabled Information Superhighway

Internet, TCP/IP, E-mail, FTP, Usenet, Telnet, World Wide Web, Cyberspace - these arcane terms were coined as part of the communications revolution that's overtaken the computer world during the last few years. It's an area I've recently had to start grappling with, so in the next few issues I'm hoping to share some of my experiences with you, dispel some of the mystique surrounding this brave new world, and perhaps even encourage you to start exploring it yourself.

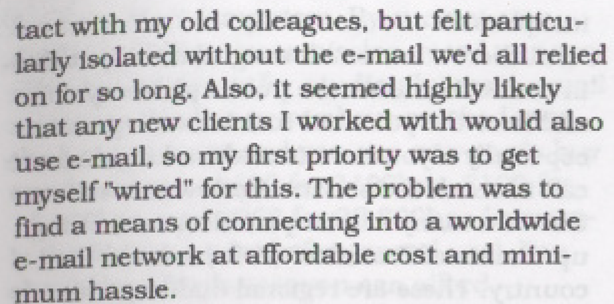
This first article describes how I found myself needing an electronic mail (e-mail) connection with the world, and how this led me to sign up with a communications "service provider" to obtain a means of accessing the Internet.

First, I have a terrible confession to make - my initial experience is based on using an IBM PC rather than an Atari system. OK, OK, you may think I'm a traitor, but my choice of computer was driven by a business requirement not personal preference. My intention now is to employ the knowledge gained with the PC to attempt to connect my Atari STE and 130XE to the Internet, and find out what it has to offer the Atari community.

GOTTA GET WIRED!



A little over a year ago I left the company I'd been with for most of my working life to set up a business of my own. Almost everyone I previously worked with routinely used electronic communications - fax, electronic mail (e-mail), data file transmission, bulletin board access, remote database access, and so on. In my new business I still needed regular contact with my old colleagues, but felt particularly isolated without the e-mail we'd all relied on for so long. Also, it seemed highly likely that any new clients I worked with would also use e-mail, so my first priority was to get myself "wired" for this. The problem was to find a means of connecting into a worldwide e-mail network at affordable cost and minimum hassle.



On studying the computer magazines it soon became clear that the Internet was taking off in a big way. Everyone was getting themselves connected - big companies, small businesses, and even private individuals were signing up with Internet service providers for access facilities ranging from simple e-mail to complex on-line multimedia applications. I was aware of the Internet but hadn't really paid much attention to it, as I thought it was used mainly by universities, the military, and government projects. A little research showed this was no longer the case, as the following background information illustrates.

THE OBLIGATORY HISTORICAL BIT...

The Internet's origin can be traced back to 1969, when a USA defence research project was set up to create a resilient data communications network which would still work if part of it became disabled by some technical glitch - such as a nuclear attack! American universities were brought in to help with the research, and soon four computers were connected and the feasibility of the concept demonstrated. The network became known as ARPAnet. The military eventually went their own way and created DARPAnet based on similar concepts, but ARPAnet began to grow as American universities clamoured for connection to allow easy data exchange. By 1971 there were about two dozen systems connected, and over 40 by the following year. At this point the first real e-mail system capable of distributing mail messages across the network was established.

In 1973 ARPAnet went international with the connection of several universities in Europe taking the number of computers past the 60 mark. So far the connected machines were individual mainframes each supporting large numbers of terminal users scattered across the USA and Europe, but with the advent of mini-computers the idea of "Local Area Networks" (LANs) to interconnect a number of smaller computers within a limited area (e.g. an office block) came into being - and the Ethernet LAN was born.

As LANs came into use the next logical step was to provide gateway connections from them into the ARPAnet, providing all the LAN attached computers and their users with access. It's probably this which led to the idea of ARPAnet being a "network of networks", a term now also applied to the Internet. By 1982 a set of standards was established for interconnecting systems and networks, using software based on Transmission Control Protocol (TCP) and Internet Protocol (IP). Theoretically, any type of system using these standards would be able to easily connect in. The set of networks thus interconnected became known as the Internet, and the name and TCP/IP standards are still with us today.

Funding by various academic and government bodies in the countries using the network allowed the Internet's "backbone" infrastructure to grow to take an ever increasing number of connections. The overall concept of the Internet was such that this could be done with minimal impact to existing users - to most users the growth was invisible. This infrastructure is likely to form the basis of what will become the much discussed "Information Superhighway" of the future. 



COMMERCIAL CONNECTIONS

In 1984 IBM launched the PC, then low cost workstation computers began to appear, and from here on connections to the Internet began to rapidly accelerate and soon over 1,000 systems were connected. By 1986 there were over 5,000 systems connected, 10,000 by 1987, and 100,000 by 1989. Up to this time connections were mainly related to academic or government research activities, but then a major breakthrough occurred. It was decided that e-mail gateways would be allowed between the Internet and commercial networks, and companies immediately began connecting their private networks to allow easy e-mail exchange with other companies. MCI and CompuServe were the first in with "public" e-mail services, although they were still rather expensive to use at that time.

This was followed later by the availability of full Internet facilities via service providers offering direct connection to the Internet. Competition caused prices to tumble, opening the floodgates further, and by 1991 there were over 500,000 systems connected. The millionth system connected in the summer of 1992 and the connection rate has continued rising since then. It's been estimated that at the current rate of growth everyone on the planet could have an Internet connection within the next seven years!

This explosive growth was made possible by service providers making available low cost dial-in gateways to the Internet. By low cost I mean from as little as £6 per month for simple e-mail facilities up to around £20 a month for more complex services (plus a small one-off set-up charge). The big surprise was that these are usually flat rate charges, with no extra costs related to usage time or data traffic you generate. I was amazed it was so inexpensive.

But there's one small snag. Naturally, a dial-in connection uses the public phone system, and here the potential cost is much greater, especially if you have to make a long distance call to reach the service. However, to reduce this cost many service providers are setting up "Points of Presence" (PoPs) around the country. These are regional dial-in points, which theoretically allow you to call a local number to connect to a distantly located service. PoPs tend to be in the major centres of population such as Birmingham, Manchester, Bristol, and Edinburgh, but smaller cities such as Cambridge may also have one. Unfortunately if you aren't near a PoP you still have to make a long distance call.

Some companies (CompuServe for example) provide PoPs which use Mercury or BT data transmission services for onward connection to the gateway. These carry an additional charge over and above the cost of your local call, but the total cost is still less than a normal long distance call.

FREE ACCESS?

Even better, some cable TV/phone companies now offer free off-peak local calls so if you and your service provider subscribe to the same cable network then your calls could be totally free!

Certain service providers advertise completely free Internet access, but their gateways can often only be reached via BT's horrendous premium rate 0891 numbers, making the overall usage cost VERY high. Beware!

Connection to any data communications system via a phone line requires a modem, a piece of equipment which turns digital data into a signal suitable for transmission via the phone system. I already had an old modem, previously used for accessing bulletin boards from my Atari computers. By current standards its 300bps transmission speed was very slow, but adequate for sending Internet e-mail messages. Modem prices have crashed over the last two years and you can now easily buy one from around £60 for 2400bps, £100 for 14,400bps, and £200 for 28,800bps (currently the fastest available for general use). You should buy the fastest you can afford.

CHOOSING A SERVICE PROVIDER

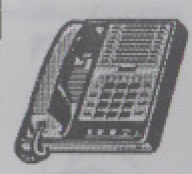
My next action was to survey the marketplace and determine which service provider gave me the best value for money for the facilities I needed. After much research three companies made my shortlist, all meeting my requirements for a total cost of around £10 per month. Wider consideration including how each treated me as a potential customer; support facilities provided; additional facilities available; and general reputation helped me make a final decision. Although they didn't offer full Internet facilities at the time, CompuServe got my vote.

You also need suitable communications software to enable you to dial into a service. Most service providers include this as part of the deal, or even as a "freebie" in advance of signing up to tempt you into trying out their service. Some of this is excellent, using custom graphical user interfaces for maximum ease of use. The trouble is it's usually only available for the IBM PC or Apple Mac - Atari users have to make do with whatever generic communications programs they can find, and operate in text mode. I obtained one of CompuServe's free trial kits given away as a computer magazine cover disk, installed and configured the software to suit my PC system, and fired it up. It dialled into CompuServe via the Cambridge PoP, registered me as a new user, and I began using the service straight away.

One of my first actions was to use CompuServe's Internet gateway to send e-mail messages to all my old colleagues in the UK and abroad announcing my new e-mail address. Within a few hours I received replies back from them all. Yes, it really worked! I'd taken my first step into cyberspace, the mystical world frequented by Internet users.

In the next issue I'll tell you more about CompuServe and its recently announced full Internet connection service, and what this means for Atari users. In the meantime if anyone reading this already has e-mail access please drop me a note via the Internet. I'll be delighted to hear from you, especially if you tell me about your experiences using your Atari on the 'Net.

Contact John Davison on
100256.1577@compuserve.com
*or **100256,1577** from within CompuServe*



WANNABE AN

ST REVIEWER?

As we no longer have a regular ST reviewer this could be your chance to make a contribution to New Atari User with a review. We have the following software for review

E-Z ART

(you guessed it, a drawing package)

HERO

(an arcade blast)

If you would like to be the reviewer of either of these, please get in touch. We would prefer someone who has written reviews before (not necessarily for Page 6) but that is not crucial if you can write. You get to keep the software and get the fame of having your name in the magazine!

ST PUBLIC DOMAIN



THE WORLD OF BUDGIE PART 2

This time in PD Roundup we continue our look into the world of Budgie UK, whose range of software has recently been released into the public domain.

Budgie were noted for their quality games. Right from the word go they marketed titles by talented programmers. It's true that not all of these games were out of the top drawer but most were!

Let the games commence.

by Stuart Murray

ST SHANGHAI

If you are looking for a new puzzle game for your ST then check out **MATCH-IT!** This is a clone of Shanghai, the puzzler in which you have to remove tiles from a board by searching them out pair by pair. The game begins with 96 tiles which must be paired off before a timer runs out. You don't have long so move that mouse quickly!

As in Shanghai, you can only pair off tiles which can be joined with a connection line of two corners or less. Also, the tiles must be in a free area, i.e. not blocked by other tiles. These factors make for a very challenging game.

There are some special tiles in Match-it! which stop the clock for a short time. Flower are matched to flowers, seasons to seasons. Both can help when you're in a sticky situation and can't find a pair. By hitting the HELP key, however, you can get the computer to pick out a pair of tiles for you. You begin with two of these helps and one is added after the completion of each level. Try to hang onto your helps if possible because they are added to your score at the end of each level.

The graphics in Match-it! are detailed and colourful. The overall appearance is of a commercial release. The background music is pleasant but does become annoying after a while. Press 'M' to toggle it on or off.

One criticism is that Match-it! operates on a single level of tiles. The true version of Shanghai is in 3D with tiles piled on top of one another. A 3D option would have rounded off the game perfectly. This gripe aside, Match-it! is great entertainment and truly addictive for any fan of puzzles.

THE RETURN OF JETPAC

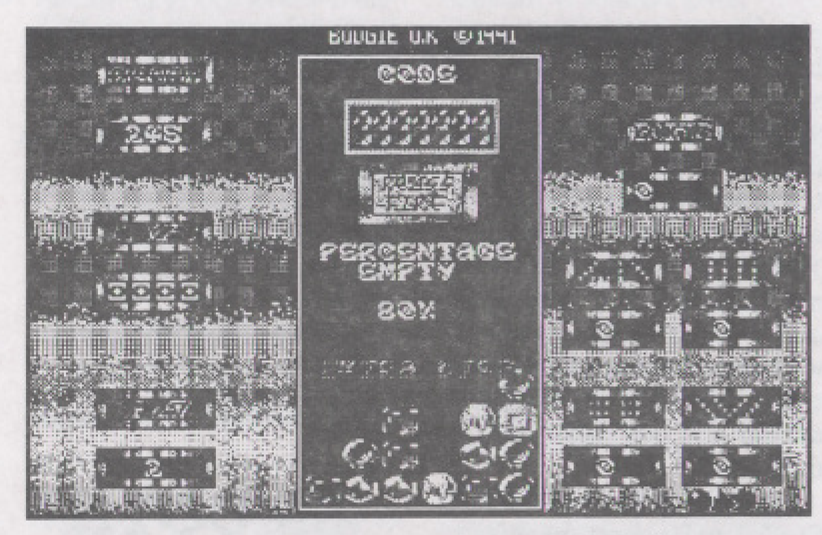
Budgie UK's **JETPAC** is a conversion of that old Spectrum shoot-em-up of the same name which received rave reviews back in 1984. I remember playing the game at the time and wondering what all the fuss was about. After all, there were dozens of far superior titles on the Atari 800! Anyway, for old time's sake, an ex-Speccy owner has decided to bring Jetpac into the 90's and onto your ST.

The object of this game is to guide the jet-packed character around the screen collecting parts of a rocket which must be dropped over a landing pad at the bottom. This allows you to build the rocket and therefore escape to the next level. There are three rocket parts to collect plus six packages of fuel. Attempting to halt your progress are a number of enemies including fireballs, bouncing bubbles, indestructible mines and homers.

Some enemies can take multiple hits. Touch an enemy and you explode! However, if you manage to grab an air bubble you become invincible for a short while. Also flying around are a variety of bonuses which can boost your score. This Budgie UK version features 50 levels and an end sequence. I don't know what the end sequence entails because I became bored long before it!

The screen layout consists of three platforms hanging in the air and a landing pad on the ground. Parts of the rocket are positioned on each platform and fuel packages fall from the sky. All must be delivered to the platform to allow take-off. Everything in the screen layout is large in design and thus creates a claustrophobic atmosphere which dampens the entertainment. Gameplay is just too repetitive to offer anything more than a few games. On the plus side, Jetpac is written in machine code and moves both fast and smooth. The inertia on the main character is well done, as is the title sequence (which looks like a demo). The background music is very catchy and sound effects, although a little sparse, are quite good.

As a PD title, Jetpac is perhaps worth a blast if you want to recall memories of the original, however, as far as I am concerned, it is still as average today as it ever was and should remain buried in the Speccy graveyard! It's certainly not of the usual high standard expected from Budgie.



STACK 'EM UP - Tetris with a subtle difference!

TANTALIZING TETRIS

Resuming normal service, Budgie have released **STACK 'EM UP**, a superb version of Tetris which just had to make it into this collection of reviews!

Tetris is an all-action puzzle game in which you have to manipulate falling objects into vertical, horizontal and diagonal lines. Complete a certain number of lines and you progress to the next level. Stack 'em Up features 50 levels, bonus lives, level codes, colourful graphics, background music, etc. The main play area takes up the centre third of the screen. Control is via a joystick or mouse. Use a mouse as it allows quicker movement of the pointer. There are one and two player modes. If two

player mode is selected then both players play on the same screen. The falling objects increase in speed every five levels. Every ten levels, the screen design changes and the objects transform. They begin as jewels and move onto blocks, fruits, die and disks. The objects are well drawn although one or two of the colours are quite similar and can make for confusion.

Unlike other Tetris clones, Stack 'em Up requires a far greater element of skill than luck. When a line of objects disappear and those on top fall down, any further lines created do not disappear (unless you add another object to them). Whether this was a programming oversight or not, it has certainly added to the enjoyment of the game. It makes Stack 'em Up more challenging and keeps the gameplay under your control.

Another plus point is that you can't just pile up objects in vertical lines and hope to progress to the next level. To the right of the play area are four boxes which contain the number and type of lines required for the level you are playing. The boxes are as follows: any type, vertical, horizontal and diagonal. Any number in any combination can be required to complete a level. You must also score a certain number of points. On later levels, this type of gameplay creates a teeth-grinding challenge!

Stack 'em Up is an impressive, challenging version of Tetris!

SMOOTH SPINNER

If you enjoy playing the one-armed bandit at your local arcade or pub but always seem to leave with less money than you started with then take a look at **MONEY SPINNER**. This is a classic slot machine game with all the usual features such as spinning reels, gambles, holds, nudges, etc.

You begin with ten credits. This doesn't give you long to get a win so examine the reels closely as they turn and go for the best possible chance of a pair or treble. All the old favourites are there including cherries, lemons, oranges, melons, bells, BAR's etc. There are also jets, parrots, bananas, stars, etc. Use your mouse to click on the arm and you're away!

In Money Spinner you must also maintain the number of lives (you begin with three) if you wish to continue playing. Run out of lives (or credits) and the game is over! A life is lost if you get a banana or parrot, however if you are lucky enough to get a star you are rewarded with a bonus life. This balancing act with credits and lives is a nice touch.

The spinning reels are very smooth. Graphics are colourful and sounds effects are abundant. Of course, it is the gameplay which forces you to come back for more!

Unfortunately, my copy of Money Spinner crashed once during gameplay, however I did play about twenty games so the problem is minor. Keep your write-protect closed to allow the saving of a high score at the end of a game. If your disk is write-protected the program crashes and you must reload. This really should have been error-trapped.

Money Spinner is quite an old title but it's still worth a few spins in between games of Match-it and Stack 'em Up!

The next PD Roundup will feature my third and final look into the world of Budgie. Be there or be birdseed! Budgie all the way!

ROUNDUP RATINGS

ST604 MATCH-IT!	88%
ST702 JETPAC	35%
ST499 STACK 'EM UP	85%
ST158 MONEY SPINNER	67%

contact ... contact ... contact ...

FOR SALE

CASSETTE SYSTEM: 65XE with cassette plus games on cassette and ROM cartridge. V.G.C. Original box, manual etc. Offers to Phil on 01362 637291, Extension 7155 (daytime) or 01362 637183 (evenings)

8-BIT CASSETTE GAMES: Over 100 original titles for sale at 90p each. Please write for a list to Paul, 17 Spring Road, Clifton, Shefford, Bedfordshire SG17 5RE

8-bit "APX" SOFTWARE: On disk and cassette. Around 50 original games and utilities for sale at 45p each. Please write for a list to Paul, 17 Spring Road, Clifton, Shefford, Bedfordshire SG17 5RE

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WANTED

PAPER: Does anybody know of a source of COLOURED fan-fold paper for a printer? Please ring Dennis on (01722) 744162 or write to 15, St. Martins Close, Barford St. Martin, Salisbury. SP3 4AX

SWAP: I have a TASCO 525 Power telescope and would like to swap it for a 256k 800XL system & software or an STE with at least 2Mb RAM & software. Contact John Fairbrass, 47 Absalom Drive, Cheetham Hill, Manchester M8 9EQ

PENPALS/HELP

PROGRAMS FOR DISTRIBUTION: For the Atari Classic written by a dedicated 8-bit programmer whose speciality is personalised text adventures. Have you ever heard of this concept before? For details of this and other programs, write to John Foskett, 26 Auckland Road, Kingston-upon-Thames, Surrey KT1 3BG (England)

PENPALS: A long time 8-bit owner would like to make friends with other Classic owners to swap programming ideas, information, etc. My main interests are utilities, hardware enhancements and DTP. All letters will be answered. Write to Paul, 10 Tenbury Close, Salford, Manchester M6 5BJ

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CONTACT, PAGE 6 PUBLISHING, STAFFORD, ST16 1DR

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PROGRAM LISTINGS

As most program listings would take up several pages of NEW ATARI USER we no longer publish those listings within the magazine. The programs are available ready to run on the Issue Disk which is available for each issue, details of which are found on the DISK BONUS page. If you prefer to type the programs in yourself, every listing, complete with TYPO codes, is available to subscribers free of charge. Either drop us a line or telephone and ask for the listings you require quoting the Issue number and the title.

Write to *LISTINGS, NEW ATARI USER, P.O. BOX 54, STAFFORD, ST16 1DR* or telephone *01785 41153*